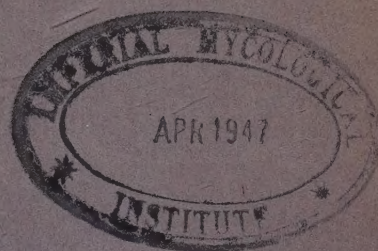


Vol. 17. No. 3. pp. 115-172
Abstracts 511-738

March, 1947



THE VETERINARY BULLETIN

1947

The delay in publication is regretted. It is due to the damage sustained by the printers through enemy action. It is hoped that normal dates of publication will soon be resumed.

IMPERIAL BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Imperial Agricultural Bureaux.

EXECUTIVE COUNCIL

Lt.-Col. J. G. ROBERTSON, <i>Chairman</i>	Canada.
Sir PATRICK R. LAIRD, C.B., F.R.S.E., <i>Vice-Chairman</i>	United Kingdom.
F. L. McDOUGALL, C.M.G.	Australia.
G. A. HOLMES, B.Sc., B.AGRIC.	New Zealand.
A. P. VAN DER POST	Union of South Africa.
J. W. DULANTY, C.B.E. (High Commissioner)	Eire.
Col. W. F. RENDELL, C.B.E.	Newfoundland.
M. K. VELLODI, C.I.E., I.C.S. (Deputy High Commissioner)	India.
B. O. BINNS, O.B.E., I.C.S.	Burma.
T. G. GISBORNE	Southern Rhodesia.
J. G. HIBBERT, M.C.	Colonies, Protectorates and Mandated Territories.
 Sir HERBERT HOWARD, 2, Queen Anne's Gate Buildings, London, S.W.1	
	<i>Secretary.</i>

IMPERIAL BUREAU OF ANIMAL HEALTH, WEYBRIDGE

Director, Veterinary Laboratory, Ministry of Agriculture and Fisheries, and Consultant Director of the Bureau :

Professor T. DALLING, M.A., M.R.C.V.S.

*Director and Editor of
The Veterinary Bulletin and of Index Veterinarius :*

W. A. POOL, M.R.C.V.S.

Assistant Director :

M. CRAWFORD, M.R.C.V.S.

Scientific Assistants :

E. MARSH JONES, M.Sc., A.R.I.C.

ENID M. SMEDLEY, M.Sc.

Editorial Assistants :

SHEILA M. GODFREY, B.A.

JOAN C. HOSKER, B.A.

PATRICIA F. STEVENS, B.A., B.Sc.

ABSTRACTORS CONTRIBUTING TO THIS ISSUE

UNITED KINGDOM		
Ruth Allcroft, PH.D., B.S.C.	C. Horton Smith, B.S.C., D.I.C.	
R. M. Arnold, B.S.C., M.R.C.V.S.	Gertrude Huehns.	
Myra L. Bingham, M.R.C.V.S.	Isobel W. Jennings, M.R.C.V.S.	
J. D. Blaxland, M.R.C.V.S.	D. W. Jolly, M.R.C.V.S.	
E. Boyland, PH.D., D.S.C.	J. Keppie, PH.D., B.S.C., M.R.C.V.S.	
J. B. Brooksby, B.S.C., M.R.C.V.S.	W. R. Kerr, B.S.C., M.R.C.V.S., PH.D.	
A. Buxton, M.R.C.V.S.	E. Klieneberger-Nobel, PH.D., D.S.C.	
J. C. Buxton, M.R.C.V.S.	E. Kodicek, M.D. (PRAGUE), PH.D.	
J. G. Campbell, F.R.C.V.S.	M. Levi, DR. MED. VET. (ALFORT)	
S. J. Chu.	J. L. McGirr, B.S.C., M.R.C.V.S.	
A. M. Copping, M.S.C.	H. S. McTaggart, B.S.C., M.R.C.V.S.	
E. Cotchin, M.R.C.V.S.	Rachel Marshall, PH.D.	
A. T. Cowie, B.S.C., M.R.C.V.S.	D. W. Menzies, M.R.C.V.S.	
Ethel M. Cruickshank, PH.D.	W. Moore, D.S.C.	
L. Davies, B.S.C.	D. D. Ogilvie, B.S.C., M.R.C.V.S.	
A. Eden, PH.D., M.A.	C. W. Ottaway, F.R.C.V.S.	
J. T. Edwards, M.R.C.V.S.	H. Paver, PH.D.	
T. E. Gibson, B.V.S.C., M.R.C.V.S.	A. T. Phillipson, PH.D., M.A., M.R.C.V.S.	
S. J. Gilbert, M.R.C.V.S.	D. S. Rabagliati, B.S.C., M.R.C.V.S., D.V.S.M.	
R. E. Glover, M.A., B.S.C., F.R.C.V.S.	R. L. Reid, B.S.C.AGR.	
J. A. Griffiths, F.R.C.V.S.	U. F. Richardson, B.S.C., M.R.C.V.S.	
G. B. S. Heath, B.S.C., M.R.C.V.S.		
W. M. Henderson, D.S.C., M.R.C.V.S.		
R. P. Hill, B.S.C., D.I.C., A.R.C.S.C.		
	Madge E. Robertson, M.D.	
	R. A. Roper, B.S.C., M.R.C.V.S.	
	Ann F. Russell, M.R.C.V.S.	
	R. F. G. Sandercock, M.R.C.V.S.	
	R. Scarisbrick, B.A. (CANTAB.), PH.D., M.R.C.V.S., A.R.I.C.	
	Kathleen J. Sinclair.	
	T. Spence, M.R.C.V.S.	
	Beryl Thurston, B.S.C.	
	E. G. White, PH.D., B.S.C., M.R.C.V.S.	
	J. Zweig, M.V.DR. (BRNO), M.R.C.V.S.	
	AUSTRALIA	
	D. C. Blood, B.V.S.C.	
	H. B. Carter, B.V.S.C.	
	L. Hart, B.V.S.C., H.D.A.	
	H. McL. Gordon, B.V.S.C.	
	Miss N. Wickham, B.V.S.C.	
	CANADA	
	R. Gwatkin, B.V.S.C.	
	Dr. W. E. Swales.	
	DENMARK	
	Prof. Dr. H. C. Bendixen	

CONTENTS

DISEASES CAUSED BY BACTERIA AND FUNGI, 115-128.

Pathogenicity in staphylococci, 115; Resistance in staphylococci to inhibitory substances, 115; Screw-worm fly as a vector of joint-ill in calves, 115; Outbreak of septic sore throat, 115; Eradicating TB. of bovine origin from human and animal populations, 115; Pathogenesis of *M. tuberculosis* grown on media containing arachis oil, 116; Atypical bovine type *M. tuberculosis*, 116; Importance of bovine TB. for human beings, 117; Beneficial effect of TB. of the skin on TB. of the lungs and larynx, 117; Vaccination with the vole bacillus, 117; Permeability of mycobacteria to sulphonamides, 117; Cultivation of tubercle bacilli, 118; Lipoid morphology of the tubercle bacillus, 118; R1 strain of tubercle bacillus in normal and silicotic pigs, 118; Surface-active substances and growth of acid-fast bacteria, 118; Depth growth of acid-fast bacilli in liquid media, 118; Allergic response of animals to tuberculin and extracts of non-pathogenic acid-fast bacteria, 119; Avian type tuberculin test reactions among cattle, 119; Tuberculin test applied to pigs, 120; Tuberculin, 120; Immunization with the vole bacillus, 120; Susceptibility of South African wild rodents to the vole strain of bacillus, 120; Serological diagnosis of Johne's disease of sheep, 121; Is *Erysipelothrix rhusiopathiae* the sole cause of swine erysipelas?, 121; Swine erysipelas, 121; Pseudotuberculosis in rodents and foxes, 121; Prophylactic measures against swine plague, 122; Cat bite and scratch wounds and pasteurella infection of man, 122; Pasteurellosis following cat bites, 122; Encephalomyelitis in dogs caused by an organism resembling Friedländer's bacillus, 122; Death of bacteria at low temperatures, 122; Elimination of Gram-negative bacilli from cultures by treatment with ether, 122; Study of *Shigella* by means of bacteriophage, 123; Coliform contamination of eggs, 123; Food poisoning in cattle by *S. typhi-murium*, 123; Antigenic structure of salmonella, 124; Form variation in Group C salmonella, 124; *Salmonella* grouping, 124; Phase-variation in salmonella, 124; Mucoid phases of brucella, 124; Control of contagious abortion in New Zealand, 124; Inoculation of cattle with *Br. abortus* strain 19, 124; Brucellosis of swine, eradication, 125; *Br. melitensis* infection in the South of France, 125; Bacillary haemoglobinuria of cattle and sheep, 125; *Cl. parasporengenes*, 125; Tetanus antitoxin, 126; Botulinum toxin (Type A), 126; Botulism from hen's eggs, 126; Systematic study of *Fusobacterium* and *Necrobacterium*, 126; Fungous diseases in Great Britain, 127; Organisms of the pleuropneumonia group in the genital tract of men and women, 127.

DISEASES CAUSED BY PROTOZOAN PARASITES, 128-129.

Species of *Giardia* in ruminants, 128; Coccidiosis in calves, 128; Pneumocystis infection in man and animals, 128; Intra-uterine transmission of *B. canis*, 128; *Rhipicephalus neavei* a vector of East Coast fever, 128; Serum reaction in dogs with relation to leptospira infections, 129; Leptospira infection in rats, 129.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA, 129-138.

State Veterinary Research Institute, Rotterdam, 129; Natural immunity against rabies, 129; Rabies vaccination with formolized virus, 129; Contagious pneumonia in horses, 130; Anaemia

following infectious bronchitis or strangles of the horse, 130; Vaccination with western equine encephalomyelitis viruses, 130; Antibodies against Japanese B virus in Okinawan horse, 130; Immunization of cattle against rinderpest, 131; *Jaagziekte*, 131; "*Bouhite*", a chronic pneumonia of sheep, 132; Response of swine to repeated vaccination with formalin-inactivated swine influenza virus, 132; Mice infected with swine influenza, 132; Collection and examination of cerebrospinal fluid of dogs, with reference to distemper, 133; Modification of the distemper virus by ferret passage, 133; Size of the virus of fowl plague, 133; Fowl plague in Croatia, 133; Central nervous system in fowl plague, 133; Diagnosis of fowl plague, 134; Avian pneumo-encephalitis vaccination, 134; Vaccination against infectious laryngotracheitis, 134; Infectious laryngotracheitis vaccination in relation to the transmission of pullorum disease, 134; New swab for infectious laryngotracheitis vaccination, 135; Vaccination against infectious laryngotracheitis, 135; Encephalitis in California, isolation of viruses from mosquitoes, 135; Bacteriostatic agents in diagnostic tests for virus infections, 135; Poliomyelitis, 136; Epidemic hepatitis, 136; Anaerobic glycolysis in brain as related to poliomyelitis, 136; Humoral and cellular immunity under conditions of optimal or deficient nutrition, 136; Transmission of poliomyelitis to monkeys by accidental laboratory infection, 137; Virus of encephalomyocarditis, 137; Rickettsial diseases in Texas, 137; Accidental infection with tsutsugamushi rickettsia, 138; Antigens from yolk sacs infected with rickettsiae, 138.

IMMUNITY, 138-140.

Allergy in certain disease syndromes in animals, 138; Enhancement of circulating antibody concentration by adrenal cortical hormones, 138; Relations of steroid hormones and anhydroxyprogesterone to fibromatosis, 139; Blocking antibody in treated hay fever, 139; Allergic encephalomyelitis, 139; Tannic acid and the production of antibodies, 139.

PARASITES IN RELATION TO DISEASE [ARTHROPODS], 140-143.

Protection from blood-sucking Diptera, 140; Insect pathology and biological control, 140; Ectoparasite ova found on domestic animals, 140; African blood-sucking insects, 140; Food economy of *Anopheles quadrimaculatus* and *A. cruciana* larvae, 141; Ixodidae on cattle in Nyasaland, 141; The ecology of *Ixodes ricinus*, 141; Function of the coxal glands in ticks, 142; Demodectic mange in cattle, 142; Sarcoptic mange of pigs, 142; Sarcoptic mange in the llama, 142; Mites—a probable factor in the aetiology of spasmodic bronchitis and asthma, 143.

PARASITES IN RELATION TO DISEASE [HELMINTHS], 143-144.

Dipylidium caninum in a pig, 143; Parasitic infestation of sheep, 143; Heavy infections with the common sheep hookworm, 143; Recovery of *Nematodirus* adults, eggs and larvae for experimental purposes, 144; Cardiac *Dictyocaulus* infestation, 144; *Ascaris lumbricoides*, 144.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS], 144-145.

Granulomatous disease of swine with resemblance to Hodgkin's disease, 144; Trauma and epithelioma, 144; Immunological factors of the rabbit fibroma virus, 145.

DISEASES, GENERAL, 145-148.

Chemical factors in inflammation, 145; Bacteria in the blood of farm animals with puerperal diseases, 145; Healing burns, with an enquiry into the significance of local infection, 145; Traumatic effects of positive intratracheal pressure, 146; Specific arthritis with pericarditis affecting horses in Tasmania, 146; Enteritis in swine, 146; Facial paralysis in cattle, 146; Neurological cases of actinomycosis in cattle, 147; Generalized anasarca in a dog with cirrhosis of the liver, 147; Stasis in pulmonary infarcts, 147; Subluxation and luxation of the crystalline lens in the dog, 147; "Pug nose" deformity of pigs, 148; Cor pseudobiloculare with situs inversus and transposition of arteries in a calf, 148; Defective interventricular septum in a calf, 148.

NUTRITIONAL AND METABOLIC DISORDERS, 148-149.

Mineral supplements for lambs, 148; Perosis in chicks used for vitamin D₃ assay, 149; Nicotinic acid in the nutrition of the pig, 149; Folic acid in nutritional haematopenia of monkeys, 149.

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY, 150-153.

Rital dehydration, 150; Effect of thiouracil on growing swine, 150; Enzymes and mechanism of invasion, 150; Haemoglobin and plasma protein production, 150; Irradiation of the gastric region with roentgen rays, 151; Sense of taste in hens, 151; Structure of the testis, 151; Colostrum pregnancy test in cattle, 151; Electrical production of semen in the g. pig, 151; Growth and reproduction of the cotton rat, 152; Histochemical reactions of the placenta of the pig, 152; Bovine cervical mucins and their reaction with oxidizing agents, 152; pH value and bacteriophage content of the faeces, 152.

POISONS AND POISONING, 153-155.

Selenium as an industrial hazard, 153; Transmission of the toxicity of D.D.T. through milk, 153; Use of bulbs in cattle feed, 153; Toxic substances of locoweeds, 153; Photosensitization produced by *H. glaziovii*, 153; Venom of South African scorpions, a specific anti-scorpion serum, 154; Sulphonamide allergy in man, 154; Hypersensitivity in sulphonamide chemotherapy, 154; Sulphonamides and nervous tissue, 155.

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION, 155-163.

Diffusion of antiseptics through agar gels, 155; Variation in *Penicillium notatum* induced by bombardment of spores with neutrons, 155; Effect of succinyl-sulphathiazole and phthalylsulphathiazole on the bacterial flora of rat faeces, 155; Staphylococcal mastitis: treatment with anatoxin, 156; Disinfection trials with phenylmercuric acetate on anthrax spores, 156; Diaminodiphenylsulphone derivatives, 156; Sulpha compounds in pulmonary

and enteric infections in swine, 156; Streptomycin in *Proteus* infections of the chick embryo, 156; Phenanthridine compounds in experimental *T. cruzi* infections, 157; Action of diamidines on *Leishmania donovani*, 157; Synthetic antimalarial drugs. Biological methods, 157; Sulphonamides: effect on *Plasmodium gallinaceum*, 158; Insecticidal sprays, 159; D.D.T. for the control of goat lice, 159; D.D.T. to control cat and dog fleas and dog lice, 159; D.D.T. as a tick repellent on domestic animals, 159; Rotenone for the destruction of cattle grubs, 160; Control of the American dog tick, 160; Control of *Boophilus australis* by gammexane, 160; Anti-inositol effect of gammexane, 160; Phenothiazine and its derivatives, 160; Arecoline hydrobromide as an anthelmintic, 161; Treatment of gastro-intestinal derangement in horses, 162; Removal of obstruction in the oesophagus by intravenous injection of veratrin, 162; Vitamins and methionine in the treatment of ketosis, 162; Phenylmercuric ointments, 162; Cetyl pyridinium chloride. I. Germicidal properties, 162.

HYGIENE, PUBLIC HEALTH AND VETERINARY SERVICES, 163-164.

Concentration of coliform organisms in raw milk and pasteurization, 163; Heat treatment of milk, 163; Meat unfit for human consumption, 163; R.A.V.C. livestock depots, 163; Food poisoning due to *S. berta*, 164; *Salmonella* infection in man from eggs, 164; Veterinary aspects of bacterial food poisoning in man, 164; Human food poisoning due to freshly cooked chicken, 164.

TECHNIQUE AND APPARATUS, 165-166.

Indigo carmine in studies on anaerobic bacteria, 165; Ultrasonic disintegration as a method of extracting bacterial enzymes, 165; Laboratory holder for rats, 165; Holder for vicious laboratory animals, 165; Rearing of mice for research purposes, 165; Shadowed replicas of tooth surfaces, 166; Endoscopic photography in the larger domestic animals, 166; A refractometer for animal eyes, 166; Evaluation of bone-continuity by sound conduction, 166; Sterilization of surgical instruments, 166.

MISCELLANEOUS, 167-169.

Effects of lighting on livestock, 167; Grouse and partridge in Canada and the role of the predator, 167; The veterinary profession and its laws, 167; Memory tests on elephants, 168; Veterinary Institute, Prague, 168; Reproduction of isolated individuals of *Lymnaea stagnalis*, 169; Breeding and feeding of g. pigs, 169.

REPORTS, 169.

China: Szechwan Province. Animal husbandry and veterinary medicine, 1944.

BOOK REVIEWS, 169-172.

Milk testing and inspection [Thieulin & Vuillaume], 169; Meat inspector's handbook [Anon.], 170; Meat inspection in the Belgian Congo [Tobback], 170; Physiology of farm animals [Marshall & Halnan], 171; Familial susceptibility to TB. [Puffer], 171; Kettle's pathology of tumours [Barnard & Robb-Smith], 172; Mosquito control [Hermes & Gray], 172.

INDEX TO AUTHORS

- ANON., 129, 136, 144, 146, 150, 155, 160, 169, 170.
- D'Abnera, V. St. E. See Carter, H. F., jt. author, 143.
- Adams, A. R. D., Maegraith, B. G., King, J. D., Townshend, R. H., Davey, T. H., & Havard, R. E., 157.
- See also Maegraith, B. G., et al., jt. authors, 157.
- Aleraj, Z., 133.
- Alexander, A. E., & Soltys, M. A., 118.
- Amor, A. J., & Pringle, P., 153.
- Andresen, P. H., 165.
- Anigstein, L., & Bader, M. N., 137.
- Audi, S., 129.
- Ault, C. N., 160.
- Bader, M. N. See Anigstein, L., jt. author, 137.
- Barker, C. A. V., 144.
- Barnard, W. G., & Robb-Smith, A. H. T., 172.
- Barnes, L. H. See Phillips, R. L., jt. author, 115.
- Bassler, C. E., 167.
- Batham, E. J., 161.
- Beach, J. R., 134.
- Beard, D. See McClean, I. W., Jr., et al., jt. authors, 132.
- Beard, J. W. See McClean, I. W., Jr., et al., jt. authors, 132.
- Beuvery-Asman, A., 129.
- Birkeland, J. M. See Hanson, H. J., et al., jt. authors, 155.
- Birkhaug, K., 117, 120.
- Blackith, R. E. See Page, A. B. P., et al., jt. authors, 159.
- Blood, D. C., & Steel, J. D., 148.
- Botod. See Marotel, et al., jt. authors, 144.
- Bodian, D. See Howe, H. A., jt. author, 137.
- Bouvier, G., 140.
- Boyland, E., 152.
- Bradley, W. H., 136, bis.
- Breed, G. B., 125.
- Breifelh, L. A. See Hauser, G. H., et al., jt. authors, 164.
- Brion, A., & Lucam, F., 122.
- Browning, C. H., Calver, K. M., Leckie, M. W., & Walls, L. P., 157.
- Bruce, H. M., Kon, S. K., Watson, J. V., Cotchin, E., & White, E. G., 149.
- Brug, S. L. See van der Meer, G., jt. author, 128.
- Bruhn, P. A., & Jørgensen, K. L., 115.
- Brumpt, E., 169.
- Budd, V. See Yegian, D., jt. author, 117.
- Buddle, M. B., 124.
- Burrell, M., 115.
- Cairry, C. F., 151.
- Calomon, F. T., & Raiziss, G. W., 156.
- Calver, K. M., See Browning, C. H., et al., jt. authors, 157.
- Cameron, H. S., 125.
- Canham, A. S., 119.
- Carmichael, E. B., McBurney, R., & Cason, L. R., 165.
- Carter, H. F., & D'Abnera, V. St. E., 143.
- Carterwright, B. W., 167.
- de Carvajal-Forero, J. See Hueper, W. C., jt. author, 151.
- Cason, L. R. See Carmichael, E. B., et al., jt. authors, 165.
- Cassamagnagi, A., hijo, 142.
- Chalker, J. W. S., 115.
- Charton, A., & Portal, F., 162.
- Chase, J. H., White, A., & Dougherty, T. F., 138.
- China. Rep. Szechwan agric. Res. Sta., 1941, 169.
- Christie, R., North, E. A., & Parkin, B. J., 119.
- Christoffersen, P., 156.
- Clay, A. L., 120.
- Colley, L., 151.
- Collier, H. O. J., & Lourie, E. M., 157.
- Collins, D. L. See Glasgow, R. D., jt. author, 160.
- Conte, A., & Pleindoux, A., 167.
- Cooper, K. E., & Woodman, D., 155.
- Corre, L. See Ramon, G., et al., jt. authors, 139.
- Cotchin, E. See Bruce, H. M., et al., jt. authors, 149.
- Cottier, R., 166.
- Couet, 128.
- Craige, J. E., 163.
- Curd, F. H. S., Davey, D. G., & Rose, F. L., 157.
- Dalling, T., 115.
- Davey, D. G. See Curd, F. H. S., et al., jt. authors, 157.
- Davey, T. H. See Adams, A. R. D., et al., jt. authors, 157.
- See also Maegraith, B. G., et al., jt. authors, 157.
- Davis, C. L. See Forbus, W. D., jt. author, 144.
- Davis, D. H. S. See Grasset, E., et al., jt. authors, 120.
- Deeny, J., & MacCormack, J. D., 136.
- van Dejnse, F., 116.
- Delez, A. L. See Hutchings, L. M., et al., jt. authors, 124.
- Della Santa, R. See Veyrassat, J., jt. author, 122.
- Demnitz, A., & Scheepers, G., 126.
- Dempsey, E. W. See Wislocki, G. B., jt. author, 152.
- Deschiens, R., & Lamy, L., 128, 160.
- Dinter, Z. See Fortner, J., jt. author, 121.
- Doan, C. A. See Saslaw, S., et al., jt. authors, 136.
- See also Wilson, H. E., et al., jt. authors, 149.
- Donatien, A. See Sergeant, Ed., et al., jt. authors, 159.
- Donham, C. R. See Hutchings, L. M., et al., jt. authors, 124.
- Dougherty, T. F. See Chase, J. H., et al., jt. authors, 138.
- Doyle, L. P., 146.
- Drea, W. F., 118.
- Dublin, I. N., 132.
- Duff, G. L. See More, R. H., et al., jt. authors, 154.
- Duncan, J. T., 127.
- Dungal, N., 131.
- Duran-Reynals, F., 145.
- Eberbeck, E., & Hemmert-Halswick, A., 130.
- Edwards, P. R., 124.
- Eichelberger, L., & Roma, M., 147.
- Eklund, H. W. See Lamanna, C., et al., jt. authors, 126.
- Emmel, M. W., 115.
- Endal, O. T., & Ulvesli, O., 148.
- van den Ende, M., Locket, S., Hargreaves, W. H., Niven, J., & Lennhoff, L., 138.
- Engelmann, C., 151.
- Fissmer, E., 148.
- Follis, R. H., Jr. See Wintrobe, M. M., et al., jt. authors, 149.
- Forbus, W. D., & Davis, C. L., 144.
- Formston, C., 147.
- Fortner, J., & Dinter, Z., 121.
- Foter, M. J. See Quisno, R., jt. author, 162.
- Francis, J., 115.
- Fraps, G. S., & Wender, S. H., 153.
- Freire, S. A., & Paraense, W. L., 158.
- French, A. J., 154.
- Frobisher, M., Jr. See Thomen, L. F., jt. author, 123.
- Fulton, M., 124.
- Furness, T. L., 134, 135.
- Galindo, P. See Hammon, W. McD., et al., jt. authors, 135.
- Gardner, L. U. See Steenken, W., Jr., jt. author, 118.
- Garrard, E. H., 123.
- Ginzler, A. M. See Tatum, H., jt. author, 146.
- Glasgow, R. D., & Collins, D. L., 160.
- Gordon, J., Hall, R. A., Heggie, R. M., & Horne, E. A., 145.
- Gorrie, C. J. R., 134, 135, bis.
- Grasset, E., Murray, J. F., & Davis, D. H. S., 120.
- , Schaafsma, A., & Hodgson, J. A., 154.
- Gratecos. See Marotel, et al., jt. authors, 144.
- Gray, D. F., 164.
- Gray, H. F. See Herms, W. B., jt. author, 172.
- Green, D. E. See Stumpf, P. K., et al., jt. authors, 165.
- Green, H. H., 120.
- Green, R. G., 133.
- Gruenwald, P., 151.
- Grzimek, B., 168.
- Guthrie, J. E. See Telford, H. S., jt. author, 153.
- Haas, E., 150.
- Habermann, R. T., 143.
- Hall, R. A. See Gordon, J., et al., jt. authors, 145.
- Halnan, E. T. See Marshall, F. H. A., jt. author, 170.
- Hammon, W. McD., & Reeves, W. C., 135.
- , Reeves, W. C., & Galindo, P., 135.
- Hansen, L. T., 165.
- Hansmann, G. H., & Tully, M., 122.
- Hanson, H. J., Myers, W. G., Stahly, G. L., & Birkeland, J. M., 155.
- Hargiss, C. O. See Weiser, R. S., jt. author, 122.
- Hargreaves, W. H. See van den Ende, M., et al., jt. authors, 138.
- Hart, 135.
- Hauser, G. H., Treuting, W. L., & Breiffelh, L. A., 163.
- Hauser, H., 147.
- Havard, R. E. See Adams, A. R. D., et al., jt. authors, 157.
- See Maegraith, B. G., et al., jt. authors, 157.
- Hecke, F., 134.
- Heggie, R. M. See Gordon, J., et al., jt. authors, 145.
- Hemmert-Halswick, A. See Eberbeck, E., jt. author, 130.
- Henschen, E., 117.
- Herns, W. B., & Gray, H. F., 172.
- Hodes, H. L., Thomas, L., & Peck, J. L., 130.
- Hodgson, J. A. See Grasset, E., et al., jt. authors, 154.
- Hogan, A. G. See Muhrer, M. E., jt. author, 150.
- Holstein, G. See Richou, R., jt. author, 156.
- Horne, E. A. See Gordon, J., et al., jt. authors, 145.
- Howe, H. A., & Bodian, D., 137.
- Hsiung, T. S., 169.
- Huddelson, I. F., 124.
- Huiper, W. C., & de Carvajal-Forero, J., 151.
- Humphreys, S. See Wintrobe, M. M., et al., jt. authors, 149.
- Hupbauer, A., & Topolnik, E., 133.
- Hutchings, L. M., Delez, A. L., & Donham, C. R., 124.
- Inglesias, R., & Lipschutz, A., 139.
- Ionescu, D., 129.
- Ivanitskii, S. V., Tsybmal, T. G., & Nosik, A. F., 143.
- Jensen, E., 162.
- Joannon, P. See Ramon, G., et al., jt. authors, 139.
- Jørgensen, J. P., 119.
- Jørgensen, K. L. See Bruhn, P. A., jt. author, 115.
- King, J. D. See Adams, A. R. D., et al., jt. authors, 157.
- See also Maegraith, B. G., et al., jt. authors, 157.
- Kirkwood, S., & Phillips, P. H., 160.
- Kon, S. K. See Bruce, H. M., et al., jt. authors, 149.
- Knežević, M., 168.
- Kutschera-Aichbergen, H., 117.
- Lahelle, O., & Thjötta, T., 126.
- Lama, A., 129.
- Lamanna, C., Eklund, H. W., & McElroy, O., 126.
- Lamy, L. See Deschiens, R., jt. author, 128.
- Leckie, M. W. See Browning, C. H., et al., jt. authors, 157.
- Lees, A. D., 142.
- Leith, T. S. See McNutt, S. H., jt. author, 121.
- Lennhoff, L. See van den Ende, M., et al., jt. authors, 138.
- Lewis, E. A., Piercy, S. E., & Wiley, A. J., 128.
- Limont, A. G., 163.
- Lipschutz, A. See Inglesias, R., jt. author, 139.
- Lisbonne, M., 125.
- Locket, S. See van den Ende, M., et al., jt. authors, 138.

- Lourie, E. M. See Collier, H. O. J., jt. author, 157.
 Lucam, F., 132.
 —. See also Brion, A., jt. author, 122.
- McBurney, R. See Carmichael, E. B., et al., jt. authors, 165.
 McClean, I. W., Jr., Beard, D., Taylor, A. R., Sharp, D. G., & Beard, J. W., 132.
 McClung, L. S., 164.
 McCormack, J. D. See Deeny, J., jt. author, 136.
 McCullock, E. C., 166.
 McElroy, O. See Lamanna, C., et al., jt. authors, 126.
 McManus, J. F. A., 118.
 McMillan, G. C. See More, R. H., et al., jt. authors, 154.
 McNutt, S. H., & Leith, T. S., 121.
 Maegraith, B. G., Adams, A. R. D., King, J. D., Townshend, R. H., Davey, T. H., & Havard, R. E., 157.
 —. See also Adams, A. R. D., et al., jt. authors, 157.
 Marotel, Gratecos, & Bodet, 144.
 Marshall, F. H. A., & Halnan, E. T., 170.
 Maunsell, K., 139.
 van der Meer, G., & Brug, S. L., 128.
 Menkin, V., 145.
 Messerli, W., 146.
 Meyer, B. J., & Meyer, R. K., 152.
 Meyer, E. See Ordal, Z. J., jt. author, 156.
 Meyer, R. K. See Meyer, B. J., jt. author, 152.
 Miller, A. K., 155.
 Miller, L. L. See Robscheit-Robbins, F. S., et al., jt. authors, 150.
 Milne, A. L., 147.
 Mitchell, D. T., & le Roux, P. L., 131.
 Mitscherlich, E., 123.
 More, R. H., McMillan, G. C., & Duff, G. L., 154.
 Morgan, I. M., 139.
 —. See also Olitsky, P. K., et al., jt. authors, 130.
 Moses, C., 147.
 Müssmeier, 163.
 Muhrer, M. E., & Hogan, A. G., 150.
 Murray, J. F. See Grasset, E., et al., jt. authors, 120.
 Myers, W. G. See Hanson, H. J., et al., jt. authors, 155.
- Neumann-Kleinpaul, K., 166.
 Nieuwland, I. C. H., 153.
 Nigge, K.-H., 133.
 Niven, J. See van den Ende, M., et al., jt. authors, 138.
 Nörr, J., 142.
 North, E. A. See Christie, R., et al., jt. authors, 115.
 Northoff, H., 118.
 Nosik, A. F. See Ivanitskiĭ, S. V., et al., jt. authors, 143.
- Olitsky, P. K., Morgan, I. M., & Schlesinger, R. W., 130.
 Ordal, Z. J., & Meyer, E., 156.
 Ottosen, H. E., 129, 148.
 Oxer, 135.
- Page, A. B. P., Stringer, A., & Blackith, R. E., 159.
 Paraense, W. L. See Freire, S. A., jt. author, 158.
 Parish, H. E., & Rude, C. S., 159.
 Parkin, B. J. See Christie, R., et al., jt. authors, 115.
 Parrot, L. See Sergeant, Ed., et al., jt. authors, 159.
 Pavlovskii, E. N., 140.
 Pearce, R., 122.
 Peck, J. L. See Hodes, H. L., et al., jt. authors, 130.
 Peiracy, S. E. See Lewis, E. A., et al., jt. authors, 128.
 Petersen, A., 144.
 Phillips, P. H. See Kirkwood, S., jt. author, 160.
 Phillips, R. L., & Barnes, L. H., 115.
 Pleindoux, A. See Conte, A., jt. author, 167.
- Portal, F. See Charton, A., jt. author, 162.
 Pringle, P. See Amor, A. J., jt. author, 153.
 Puffer, R. R., 171.
- Quisno, R., & Foter, M. J., 162.
- Rainey, J. W. See Ryan, A. F., jt. author, 146.
 Raiziss, G. W. See Callomon, F. T., jt. author, 156.
 Ramon, G., Joannon, P., Richou, R., & Corre, L., 139.
 Records, E., & Vawter, L. R., 125.
 Reeves, W. C. See Hammon, W. McD., jt. author, 135.
 —. See also Hammon, W. McD., et al., jt. authors, 135.
 Reiner, J. M. See Utter, M. F., et al., jt. authors, 136.
 Renn, C. E., 141.
 Richou, R., & Holstein, G., 156.
 —. See also Ramon, G., et al., jt. authors, 139.
 Rislakki, V., 121.
 Ritchie, J. N., 115.
 Robb-Smith, A. H. T. See Barnard, W. G., jt. author, 172.
 Robscheit-Robbins, F. S., Miller, L. L., & Whipple, G. H., 150.
 Rocha e Silva, M., 153.
 Roma, M. See Eichelberger, L., jt. author, 147.
 Rose, F. L. See Curd, F. H. S., et al., jt. authors, 157.
 le Roux, P. L. See Mitchell, D. T., jt. author, 131.
 Rude, C. S. See Parish, H. E., jt. author, 159.
 Ryan, A. F., & Rainey, J. W., 146.
- Salaman, M. H., et al., 127.
 Saphra, I. See Seligmann, E., et al., jt. authors, 124.
 Saslaw, S., Wilson, H. E., Doan, C. A., Woolpert, O. C., & Schwab, J. L., 136.
 —. See also Wilson, H. E., et al., jt. authors, 149.
 Savage, W., 115.
 Schaafsma, A. See Grasset, E., et al., jt. authors, 154.
 Scheepers, G. See Demnitz, A., jt. author, 126.
 Schlesinger, R. W. See Olitsky, P. K., et al., jt. authors, 130.
 Schmid, G., 124.
 Schmidt, H., 124.
 Schneider, K., 143.
 Schwab, J. L. See Saslaw, S., et al., jt. authors, 136.
 Schweighäuser, F., 163.
 Scott, D. B., & Wyckoff, R. W. G., 166.
 Seidenstücker, H., 126.
 Seligmann, E., Saphra, I., & Wassermann, M., 124.
 Sergeant, Ed., Donatien, A., & Parrot, L., 159.
 Sharp, D. G. See McClean, I. W., Jr., et al., jt. authors, 132.
 Shaw, J. C., 162.
 Shepard, C. C. See Topping, N. H., jt. author, 138.
 Sigurdsson, B., Vigfússon, H., & Theodors, S., 121.
 Smadel, J. E. See Warren, J., jt. author, 137.
 Smith, F. W., Jr. See Stumpf, P. K., et al., jt. authors, 165.
 Smith, H. C., 156.
 Solomides, J., 116.
 Soltys, M. A. See Alexander, A. E., jt. author, 118.
 Spalatin, J., 152.
 Stahly, G. L. See Hanson, H. J., et al., jt. authors, 155.
 Steel, J. D. See Blood, D. C., jt. author, 148.
 Steenken, W., Jr., & Gardner, L. U., 118.
 Stein, H. J. See Wintrobe, M. M., et al., jt. authors, 149.
 Steinhaus, E. A., 140.
 Stringer, A. See Page, A. B. P., et al., jt. authors, 159.
 Strozzi, P., 123.
 Stumpf, P. K., Green, D. E., & Smith, F. W., Jr., 165.
- Sweetman, H. L., 159.
 Tatum, H., & Ginzler, A. M., 146.
 Taylor, A. R. See McClean, I. W., Jr., et al., jt. authors, 132.
 Telford, H. S., & Guthrie, J. E., 153.
 Ter Borg, H., 162.
 Theodors, S. See Sigurdsson, B., et al., jt. authors, 121.
 Thieulin, G., & Vuillaume, R., 169.
 Thjötta, T. See Labelle, O., jt. author, 126.
 Thomas, L. See Hodes, H. L., et al., jt. authors, 130.
 Thomen, L. F., & Frobisher, M., Jr., 123.
 Tobback, L., 170.
 Toop, C. R., 142.
 Topolnik, E. See Hupbauer, A., jt. author, 133.
 Topping, N. H., & Shepard, C. C., 138.
 Townshend, R. H. See Adams, A. R. D., et al., jt. authors, 157.
 —. See also Maegraith, B. G., et al., jt. authors, 157.
 Treuting, W. L. See Hausing, G. H., et al., jt. authors, 163.
 Tsymbal, T. G. See Ivanitskiĭ, S. V., et al., jt. authors, 143.
 Tully, M. See Hansmann, G. H., jt. author, 122.
- Ulrich, K., 168.
 Ulvesli, O. See Engdal, O. F., jt. author, 148.
 Umberger, E. J., 165.
 U.S.A. Swine enteritis comm., 146.
 Utter, M. F., Reiner, J. M., & Wood, H. G., 136.
- Vanderplank, F. L., 140.
 Vawter, L. R. See Records, E., jt. author, 125.
 Veyrassat, J., & Della Santa, R., 122.
 Vigfússon, H. See Sigurdsson, B., et al., jt. authors, 121.
 Vuillaume, R. See Thieulin, G., jt. author, 169.
- Walls, L. P. See Browning, C. H., et al., jt. authors, 157.
 Wagenaar, G., 145.
 Warren, J., & Smadel, J. E., 137.
 Wassermann, M. See Seligmann, E., et al., jt. authors, 124.
 Watt, J., 164.
 Watson, J. V. See Bruce, H. M., et al., jt. authors, 149.
 Webster, A., 135.
 Weiser, R. S., & Hargiss, C. C., 122.
 Weissberg, J. L., 166.
 Wender, S. H. See Fraps, G. S., jt. author, 153.
 Whipple, G. H. See Robscheit-Robbins, F. S., et al., jt. authors, 150.
 White, A. See Chase, J. H., et al., jt. authors, 138.
 White, E. G. See Bruce, H. M., et al., jt. authors, 149.
 Wiley, A. J. See Lewis, E. A., et al., jt. authors, 128.
 Wilson, H. E., Saslaw, S., & Doan, C. A., 149.
 —. See also Saslaw, S., et al., jt. authors, 136.
 Wilson, S. G., 141.
 Wintrobe, M. M., Stein, H. J., Follis, R. H., Jr., & Humphreys, S., 149.
 Wislocki, G. B., & Dempsey, E. W., 152.
 Wood, H. G. See Utter, M. F., et al., jt. authors, 136.
 Woodman, D. See Cooper, K. E., jt. author, 155.
 Woolpert, O. C. See Saslaw, S., et al., jt. authors, 136.
 Wyckoff, R. W. G. See Scott, D. B., jt. author, 166.
- Yegian, D., & Budd, V., 117.
 Yu, S. J., 122.
- Zimmer, K., 133.
 Zwijnenberg, H. A., 138.

Erratum

B.V. 16. 436, abst. 2504, 3rd para. For "fouadin (sodium pyrotechin disulphonate of sodium)", read "fouadin (sodium antimonyl catechol disulphonate)".

THE VETERINARY BULLETIN

Vol. 17.]

March, 1947.

[No. 3.]

DISEASES CAUSED BY BACTERIA AND FUNGI

CHRISTIE, R., NORTH, E. A., & PARKIN, B. J. (1946.) **Criteria of pathogenicity in staphylococci.**—*Aust. J. exp. Biol. med. Sci.* **24.** 73-78. 511

The authors tested 1,027 strains of staphylococci of both human and animal origin for their ability to produce coagulase, haemolysin, fibrolysin and pigment and for their ability to ferment mannitol. 312 of these strains were tested for pathogenicity to mice.

Details of technique and of variations in strains are given.

The conclusions drawn were that α -toxin production was the property most closely associated with pathogenicity and that this test was more reliable as a criterion for pathogenicity than the coagulase test and had technical advantages over the latter. Sheep blood agar is recommended for primary isolation in place of plain nutrient agar, so that pathogenicity can be decided immediately by the presence or absence of haemolysis, further tests being necessary only when the degree of haemolysis is less than that given by the usual pathogen.

—N. WICKHAM.

*PHILLIPS, R. L., & BARNES, L. H. (1942.) **Development of resistance in staphylococci to natural inhibitory substances.**—*J. Franklin Inst.* **233.** 396-401. [Abst. in *Brit. Chem. Physiol. Abstr.* A. III. June. p. 437 (1944), copied *verbatim*.] 512

Staphylococci grown in presence of increasing amounts of gramicidin became resistant to its inhibition. Development of resistance in successive transfers was accompanied by the production of colonial variants, especially in the lower concns. of gramicidin.

EMMEL, M. W. (1945.) **The primary screw-worm fly, *Cochliomyia Americana* C. and P., as a vector of joint-ill in calves.**—*J. Amer. vet. med. Ass.* **106.** 223. 513

Before the screwworm invaded Florida in 1933, joint-ill had been unknown in that State. Now, losses of 5% are not unusual. *Streptococcus*

pyogenes was isolated from joint capsules of infected limbs and also from the unhealed maggot-infested navels of calves. The burrowing of the fly larvae from the navel is thought to aid the invasion of the bacteria; adult flies were found to act as vectors transmitting the organisms from infected to uninfected navels.—T. SPENCE.

BRUHN, P. A., & JØRGENSEN, K. L. (1946.) **Protraheret Angina-Scarlatina-Edenmi. Langvarig Smittespredning fra en Ko med Mastitis fremkaldt af Gruppe A Streptokokker. [A prolonged outbreak of septic sore throat.]—*Maanedsskr. Dyrlaeger.* **58.** 17-26. 514**

In July, 1944, the farm-hand of a small farm in Jutland was affected with scarlatina. In two neighbouring families three persons contracted scarlatina during the following weeks. In January, May, July, August and September, 1945, new cases developed, both on the farm mentioned and in the neighbouring families. Ten persons had the disease in typical form, and two had symptoms of sore throat only. Investigations made in November, 1945, revealed that a cow had chronic mastitis of the right forequarter with secretion containing Group A streptococci in great numbers. It is presumed that the udder of the cow became infected from a milkmaid with a severe suppuration in her fingers. Some of the diseased persons obtained their food on the farm, but five from one family had only drunk raw milk bought on the farm.—H. C. BENDIXEN.

— (1946.) **Discussion on the methods to be employed in eradicating tuberculosis of bovine origin from the human and animal populations.** [Speakers:—DALLING, T., RITCHIE, J. N., SAVAGE, W., BURRELL, M., CHALKER, J. W. S., & FRANCIS, J.]—*Proc. R. Soc. Med.* **39.** 213-222. 515

In opening the discussion, DALLING reviewed four methods for the control or eradication of bovine TB., *viz.* the segregation of healthy calves, the detection and disposal of infected animals, the creation of immunity by vaccination and curative

treatment. The transmission of bovine organisms from man to cattle was mentioned as a possible method of herd infection. All these means of control depend on accurate diagnosis. The method of preparing and applying P.P.D. tuberculin was outlined and the significance of specific and non-specific reactions in g. pigs and cattle was discussed. Present investigations aim at increasing the specificity of tuberculin in the hope that eventually the "comparative" test will become unnecessary.

With regard to vaccination, a field trial with BCG was being undertaken on about 100 farms to ascertain how far it would assist farmers in converting a highly infected herd to one free from TB. Vaccination of calves was practised every six months until all the original animals in the herd had been removed. Vaccination then ceased and was followed by tuberculin tests at a suitable interval. No conclusions have yet been reached, but a few herds have already reached T.-T. status. The risks of the vaccine were enumerated. DALLING thought that present trends in chemotherapy did not indicate that vaccination could replace current methods of controlling the disease.

RITCHIE discussed the significance of the comparative intradermal test and the organisms which might give rise to non-specific reactions. The importance of segregating young calves in infected herds was stressed and mention made of the success which had followed the elimination of the older stock *en bloc* and their replacement with mature animals from Attested Herds, the original non-reacting young stock being retained. This method can be used even in valuable pedigree herds. The employment of two sets of buildings, one for reactors and one for non-reactors, was not satisfactory since at subsequent re-tests reactors might still be found in the non-reacting group. With regard to the primary tests, an owner would be well advised to dispose of all non-reactors in a group of cattle if there were more than 20% reactors. Experience had shown that further tests in such groups were often unsatisfactory. The advantages of area eradication in which all reactors were compulsorily slaughtered when a substantial proportion of the population had become tuberculin-negative were cited. The chief benefit was the possibility of increasing the interval of tuberculin tests which under present conditions must be applied fairly frequently. Figures were given showing the progress of the Attestation Scheme and the probable incidence of TB. in Great Britain. The proportion of reactors was assessed at 17-18% of all cattle.

SAVAGE considered the slaughter and compensation policy as too expensive for this country.

As an alternative he suggested the creation of special farms for reacting cattle instead of the present unsatisfactory mixture of reactors and non-reactors. He thought that if milk were pasteurized there would be no danger to the human population.

BURRELL felt that the scheme suggested by SAVAGE would raise considerable administrative difficulties owing to the annual transfer of large numbers of animals from the breeding areas in the West to the dryer cereal districts. Any attempt to stop this migration would interfere severely with the whole of the store cattle trade. He favoured the formation of small Attested Areas from which cattle could be recruited to other districts.

SALTER-CHALKER said that the farming community was not satisfied with the progress of the Attested Scheme and was pressing for the creation of Attested-Free Areas as soon as possible.

FRANCIS emphasized the importance of infection by the aerogenous route in the cow shed. He doubted whether BCG would be of much assistance and favoured the establishment of TB-free areas.—R. E. GLOVER.

I. SOLOMIDÈS, J. (1946.) Pouvoir pathogène des cultures tuberculeuses du type humain et bovin additionnées d'huile d'arachide. [**The pathogenesis of cultures of human and bovine type *Mycobacterium tuberculosis*, grown on media containing arachis oil.**—*Ann. Inst. Pasteur.* 72. 156-160. 516

II. VAN DEINSE, F. (1946.) Une souche de bacilles tuberculeux de type bovin difficile à classer. [**An atypical strain of bovine type *M. tuberculosis*.**—*Ibid.* 241-252. 517

I. When bovine strains of *M. tuberculosis* were grown on glycerol potato to which 1 ml. of arachis oil had been added to each tube, the bacilli slowly disintegrated. During the first ten days a proportion of the organisms became non acid-fast, but the cultures were still fully pathogenic for the g. pig. 10-20 days later there was further disruption with the production of acid-fast and non acid-fast granules. G. pigs inoculated with bacilli at this stage frequently died prematurely, with marked engorgement of the organs, particularly of the spleen. Tubercle bacilli were rare and no tuberculosis lesions were found. Between the 20th and 30th days, the acid-fast forms almost completely disappeared, and g. pigs inoculated then had grossly enlarged organs, but there was no evidence of tuberculous involvement.

A similar result was obtained with human strains, but the arachis oil was slower in acting on the bacilli. Subcultures at regular intervals

revealed a progressive decline in the number of typical colonies. A careful examination revealed, however, that the non acid-fast phase continued to develop and eventually covered the whole of the medium with a greyish mat. It is suggested that these forms produced the congestion and haemorrhage in the visceral organs of g. pigs. It is noted, however, that a few acid-fast bacilli seemed to resist the action of the arachis oil.

II. A g. pig was inoculated with citrated blood from a human patient suffering from pulmonary TB. and it was then injected twice a week with an acetone extract of *M. tuberculosis*. Three months later it was killed and a culture of the eugonic type which was classified as human was obtained. Although of normal virulence for g. pigs, the strain was at first avirulent for the rabbit. After a year's cultivation on potato it was found to be highly virulent for rabbits: six years later it had become less pathogenic for this species, but was still highly infective to g. pigs. After the eighth year virulence for g. pigs declined, but cultures were still eugonic.

A change in type appeared to occur, however, as a result of prolonged cultivation on bile potato (125 passages), since after inoculation into g. pigs, cultures were obtained in which all colonies were smooth instead of rough, were dysgonic and behaved in every respect like a bovine type. The author concludes that the original strain was in reality bovine.—R. E. GLOVER.

HENSCHEN, F. (1943.) Die Bedeutung der Rindertuberkulose für den Menschen. [Importance of bovine TB. for human beings in Sweden.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Nov. 12th. 401. 518

H. surveys the problem of TB. in Sweden. In West Gotland the disease is widespread in cattle. There is a case on record of a single cow infecting 40–50 children. In Sweden and Denmark, bovine type infection accounted for 4.9% of 1,814 cases examined of pulmonary TB. in man, for 49.0% of 251 cases examined of TB. of the cervical lymph nodes, for 18.5% of 567 cases examined of TB. of the bones, joints and urogenital organs and for 24.7% of 304 cases of TB. of the brain.

Some recent cases of TB. in cattle due to human type bacilli are also described. This resulted in little morbidity or infection of the milk.—J. E.

KUTSCHERA-AICHBERGEN, H. (1943.) Der heilende Einfluss von Hauttuberkulosen auf die Tuberkulose der Lungen und des Kehlkopfes. [The beneficial effect of TB. of the skin on TB. of the lungs and larynx.]—*Klin. Wschr.* No. 36/37. p.566. [Abst. from abst. in *Berl. Münch.*

tierärztl. Wschr./Wien. tierärztl. Mschr. March 31st. 114. (1944.)] 519

Natural or artificially produced TB. of the skin was instrumental in healing tuberculous lung or larynx conditions in human beings.—J. ZWEIG.

BIRKHAUG, K. (1946.) Vaccination with the vole bacillus (Wells). Protective value of percutaneous and intracutaneous vaccination. (Observations on multiple puncture vaccination on man.)—*Amer. Rev. Tuberc.* 54. 41–50. [Spanish summary.] 520

Groups of g. pigs were vaccinated with the vole bacillus by two methods *viz.*, by the intracutaneous inoculation of 0.05 mg. and by the multipuncture technique in which a 40 needle automatic snapper is allowed to pierce a section of skin previously treated with a suspension of the organisms. The reaction to the vaccine was less severe in the latter group, but both groups became highly sensitive to tuberculin after three months.

Ninety days after vaccination, these animals, with suitable controls, were tested with a small dose of virulent human type tubercle bacilli which killed the controls in an average period of 200 days. A few of the vaccinated animals died from generalized TB., but the majority survived and were killed about the 270th day. It was found that an absolute immunity was not produced by either method of vaccination, but that there was a significant prolongation of tuberculous involvement in the multipuncture group and a less marked degree of protection in the intracutaneous group.

The reactions of human subjects to vaccination with BCG. and the vole bacillus by the multipuncture method were also examined. The vole organism produced a more vigorous reaction and the marks left on the skin were very persistent, whereas those produced by BCG. soon faded. It is considered that whilst the vole bacillus may produce a high level of immunity [this point has not yet been studied], it has a smaller margin of safety as a vaccine for man.—R. E. GLOVER.

YEGIAN, D., & BUDD, V. (1945.) The permeability of mycobacteria to sulfonamides and sulfonamide-like agents.—*J. Pharmacol.* 84. 318–324. 521

Cultures of *M. tuberculosis* or *M. ranae* were freed from *p*-aminobenzoic acid by filtration and washing. They were then incubated for 48 hours in solutions of sulphathiazole. The organisms were then washed and the sulphonamide in them extracted after grinding and drying. Some sulphathiazole was taken up by the living cells, but more was taken up by a suspension of dead bacteria. The increase in the amount of sulphathiazole bound when the organisms were dead may have been due to liberation of acidic groups

on death. It is suggested that fastness to sulphonamides is due to increased production of *p*-aminobenzoic acid.—E. BOYLAND.

*NORTHOFF, H. (1940.) Versuche zur Kultur von Tuberkelbacillen auf festen Nährboden. [**Cultivation of tubercle bacilli.**]—*Inaug. Diss.* [Abst. in *Amer. Rev. Tuberc.* 52. No. 3. p. 42 of absts., slightly amended. Signed: G. SIMMONS.] 522

Comparative cultural studies were made, using the culture medium introduced by Hohn in 1940 and Löwenstein's egg-medium; 52 sputum specimens, negative on smear, and 53 positive sputum specimens were cultured on both media. Of the former, 14 positive cultures were obtained on Hohn's and 8 on Löwenstein's medium. The colonies grow faster and are larger on Hohn's medium. The preparation of Hohn's medium is simpler, because the basic mixture (Lockemann's solution, containing glycerin, 2.7 per cent, with alanin instead of asparagin) can be kept longer in a sterile state.

McMANUS, J. F. A. (1946.) **Lipoid morphology of the tubercle.** [**Correspondence.**]—*Nature, Lond.* 157. 772. 523

A culture of bovine type *Mycobact. tuberculosis* was injected into the mesenteric vein of rabbits. 14 days later portions of liver were fixed in cobalt-calcium-formol, and were stained for organisms with pyridine-fuchsin and for lipid with Sudan black. Lipoid was found in the epithelioid and giant cells of the tuberculous lesions. Reasons are given for considering that these foci correspond with the centres of lipase activity.—R. E. GLOVER.

STEENKEN, W., Jr., & GARDNER, L. U. (1946.) **R1 strain of tubercle bacillus. Its dissociation and virulence in normal and silicotic guinea pigs.**—*Amer. Rev. Tuberc.* 54. 51-61. [Spanish summary.] [Authors' conclusions copied *verbatim*.] 524

Typical cultures of the R1 strain of *Mycobacterium tuberculosis* possess a low but considerable degree of virulence for normal guinea pigs. By inhalation they provoke the formation of a single crop of primary caseous tubercles in the lungs and tracheobronchial lymph nodes with the development of a bacteremia and the establishment of abortive proliferative lesions in the spleens and livers of some of the animals. Subsequent healing by resolution is the rule. When inoculated directly into the brain they cause fatal disease of that organ.

Under artificial cultivation failure to maintain proper conditions for growth occasionally results in spontaneous dissociation of this organism with complete loss of virulence.

By a method described in this paper it is

possible to produce at will avirulent dissociants of this strain which likewise possess no demonstrable virulence.

In normal guinea pigs inoculation of these avirulent dissociants produces slight transitory, noncaseous lesions and direct injection into the brain has a similar effect without apparent influence upon health.

The undissociated parent strain appears to retain a latent power of invasiveness which becomes manifest when the resistance of the host is lowered for any reason. Examples of such depression of host resistance occur with great rarity in occasional apparently normal guinea pigs; they are a regular feature of the silicotic host.

The resistant avirulent dissociants would appear to have lost this latent power of invasiveness for they have no more effect upon silicotic than upon normal guinea pigs.

The resistant or avirulent variant of the R1 strain is in all respects like corresponding variants of other strains which arise spontaneously under prolonged cultivation on artificial media.

It is possible that silicotic animals could be used to measure minor differences in virulence of colonies obtained during the dissociation of other strains of *Mycobacterium tuberculosis*.

ALEXANDER, A. E., & SOLTYS, M. A. (1946.) **The influence of surface-active substances on the growth of acid-fast bacteria.**—*J. Path. Bact.* 58. 37-42. [Authors' summary slightly amended.] 525

The influence of fourteen surface-active compounds giving surface tension in the range 50-24 dynes/cm. in a synthetic fluid medium upon the growth of three strains of acid-fast bacteria has been investigated.

The growth of *Mycobacterium tuberculosis*, human type, was inhibited at surface tensions below about 42 dynes/cm., whereas with *Mycobacterium tuberculosis*, avian type, and *Mycobacterium phlei* growth was inhibited only at surface tensions below about 30 dynes/cm.

The chemical nature of the depressant used did not appear to be a relevant factor.

Media containing depressants showed an increase in surface tension during growth, tending to increase the value of the medium, showing that these compounds were adsorbed by the bacteria.

Solidification of growth-inhibiting liquid media by 2 per cent. agar permitted growth to occur in some cases. Possible reasons for this are discussed.

DREA, W. F. (1946.) **Depth growth of acid-fast bacilli in liquid media. I. Technique. II. Study of various technical and theoretical**

aspects.—*Amer. Rev. Tuberc.* 53. 353-362 & 363-373. [Spanish summaries.] [English summaries copied *verbatim*.] 526

I. Submerged or depth growth will take place in Long's liquid synthetic culture medium when amounts as small as 10^{-7} to 10^{-8} mg. of H37 bacilli are planted. If proper standards of cleaning the glassware are not maintained, growth may be limited to some amount of bacilli greater than 10^{-7} to 10^{-8} mg. Almost without exception, 10^{-2} mg. of the bacilli will grow even if the glass is not thoroughly cleaned. One good method of cleaning glassware is described.

Distillates from nonabsorbent cotton stoppers were growth inhibiting and this became increasingly evident because of cumulative adsorption if the culture flasks were not thoroughly cleaned between growth periods.

Paraffin, of either 54°C. or 68°C. melting point, is not inhibiting to the depth growth of the smallest numbers of H37 bacilli.

II. Tubercle and smegma bacilli grow at the bottom of liquid synthetic culture media where the dissolved oxygen is present in only a few parts per million.

The amount of depth growth following the planting of 10^{-6} mg. of H37 bacilli in 20 ml. of Long's liquid synthetic medium increased for at least twelve months. At the end of seventeen months' incubation it averaged 28.8 mg. for 5 cultures, after washing and drying at 37°C. The amount of similarly treated maximum surface growth on the same amount of the medium averaged 276 mg. The H37 bacilli were virulent for guinea pigs after 482 days of depth growth during which time they were transplanted thirteen times to the bottom of fresh synthetic medium. The injected bacilli had been growing submerged for seventy-four days following the last transplant. Death from extensive tuberculosis resulted in 104, 253 and 263 days for an average of 4 animals each for 10^{-4} , 10^{-6} and 10^{-7} mg. bacilli, respectively.

It is probable that all strains of acid-fast bacilli will grow at the bottom of any liquid synthetic medium that will support surface growth, provided no substances combining with dissolved oxygen are present. Submerged growth of tubercle bacilli is more similar to growth in animal tissues than is surface growth.

Depth culture studies in liquid synthetic media offer an important means for investigating accessory growth factors. The same may be stated for at least part of the investigation of anti-bacterial substances.

CANHAM, A. S. (1944.) The tuberculin test in guinea-pigs and cattle. The allergic response of animals to tuberculin and extracts of non-

pathogenic acid-fast bacteria.—*Onderstepoort J. vet. Sci.* 19. 29-70. 527

C. reviews the literature relating to the tuberculin test in cattle. The questions of tuberculin sensitization and the "no lesion" reactor are discussed, with especial reference to acid-fast organisms other than *Mycobacterium tuberculosis*. The experimental animals used in his earlier experiments were g. pigs; at later stages, bovines were used. The following are some of the findings recorded.

G. pigs inoculated subcutaneously with an emulsion of *Brucella abortus* reacted positively to mammalian tuberculin, while g. pigs inoculated with a saline emulsion or a liquid paraffin emulsion of avian type tubercle bacilli, or with a liquid paraffin emulsion of *M. phlei* reacted only very slightly. C. emphasizes that using dilutions of tuberculin running from 1:10 to 1:100 reactions can be obtained in g. pigs with acid-fast organisms other than *M. tuberculosis*. The group of non-pathogenic acid-fast bacilli were found to have a common antigenic factor in that they would cross-react with one another.

Cattle could be sensitized by subcutaneous injections of *M. butyricum* and *M. phlei* and gave suspicious reactions to tuberculin. *M. butyricum* was isolated from the site of inoculation some 13 months after injection: moreover, sections revealed that the pathological picture of the site of inoculation was similar to that seen in TB.

C. suggests that some of the non-specific reactions seen in animals tested with tuberculin may be due to these animals being sensitized naturally by a strain or strains of certain non-pathogenic organisms.

An extensive bibliography is appended.

—W. R. KERR.

JØRGENSEN, J. P. (1945.) Om Forekomsten af aviaire Tuberkulinreaktioner blandt Kvaeg i Jylland. [Avian type tuberculin test reactions among cattle in Jutland.]—*Maanedsskr. Dyrlæger.* 57. 248-257. 528

This statistical study of the number of cattle in Jutland reacting to avian type tuberculin tests is compiled mainly from the results of tests carried out during 1935-45.

Tables are given showing the number of cattle farms reacting to avian type tuberculin in each of the counties of Jutland and in the whole of Jutland. Farms are grouped according to the number of cattle maintained, ranging from 1-5 animals in the small farms to 75 and over in the large farms. The percentage of infected farms was lowest in the group of smallest farms (2.3% infected) and increased as the size of the farms increased, being highest in the group of farms with most cattle (18.6% infected).

The number of animals with avian type tuberculin reactions increased with the size of the farm, but the percentage of animals infected was highest in the smallest farms (averaging 1.2 infected animals as compared with 3.3 infected animals in the largest farms).

Study of the percentage distribution of cattle farms with avian type reactions over a number of years reveals that reactions to avian tuberculin died out soonest in the small farms, persisting four years at the most but in the large farms in some cases for as long as six years. 90% of the farms in which reactors to avian tuberculin were found occurred in the group of farms previously free from bovine TB.

In some farms reactors to both bovine and avian tuberculin were found and J. thinks it likely that where both forms of infection are present, the few avian may be obscured by the many bovine reactions.

Where avian reactions were found there were usually tuberculous lesions also but these were generally limited to the lymph nodes of the alimentary canal. Occasionally avian type TB. in cattle can induce tuberculous metritis followed by abortion but as a rule, the disease in the individual is not serious.—M. E. ROBERTSON.

CLAY, A. L. (1945.) **A note on the tuberculin test applied to pigs.**—*Aust. vet. J.* 21. 149-150. 529

In a test of 64 brood sows in a herd in which condemnations for TB. were frequent, the single intradermal test was used and injection was made into the loose skin at the base of the ear. 63% reacted positively at the first test and 44% at the second test, which included 18 sows negative at the first testing. Lesions were found in all positive reactors at autopsy, especially in the superficial inguinal lymph nodes. Better results were obtained from reading the test at the 96th hour than at the 72nd hour.—D. C. BLOOD.

GREEN, H. H. (1946.) **The use of tuberculin.** [Correspondence.]—*Brit. med. J.* May 25th. pp. 812-813. 530

The use of the mammalian P.P.D. prepared at Weybridge for the tuberculin test in man is suggested. The method of preparing mammalian and avian P.P.D. is described and it is stated that current issues of each are of the order of 100 litres per month, which would correspond to 2.5 to 62.5 million doses per year for human use. Production is relatively cheap.

In order that previous surveys in man can be properly linked with the potency of tuberculin it would be advisable to check Seibert's standard P.P.D., upon which American medical experience is based, with the International O.T., which has

been largely employed in studies in Great Britain, and with the P.P.D. prepared at Weybridge. The need for large doses of the active principle in veterinary practice is explained and the significance of non-specific reactions in cattle is discussed.

—R. E. GLOVER.

I. BIRKHAUG, K. (1946.) **Immunization with the vole bacillus.** The protective value of the vole bacillus (Wells) as compared with BCG against tuberculous infection.—*Amer. Rev. Tuberc.* 53. 411-426. [Spanish summary.] 531

II. GRASSET, E., MURRAY, J. F., & DAVIS, D. H. S. (1946.) **Vole bacillus.** Susceptibility of South African wild rodents to the vole strain of acid-fast bacillus and to other acid-fast bacilli. Preliminary report.—*Ibid.* 427-439. [Spanish summary.] 532

I. B. compared the immunizing value of the vole bacillus with that of BCG in the g. pig. As far as possible, the procedure adopted by WELLS & BROOKE [see *V. B.* 10. 737] was followed, with special reference to their recommendation "to leave all animals for 18 months, or as long as they survive, to determine the survival time in each group".

With regard to the pathogenicity of the vole bacillus, the findings of GRIFFITH [see *V. B.* 10. 234, 12. 262 and 13. 201] were confirmed that large doses produce widespread generalized disease, but that lesions following smaller doses are retrogressive.

In the immunity experiments, groups of g. pigs inoculated with four weekly doses of the vole bacillus (total 2 mg.) or of BCG (total 80 mg.) were tested with 0.000001 mg. of a virulent human strain. All the animals eventually died of TB. The survival times in days (S.D.) were as follows:—controls 192 (S.D. 20.6); vole bacillus-immunized 403 (S.D. 64.7); BCG-immunized 429 (S.D. 86.3). When analysed statistically, there was no significant difference between the two vaccinated groups, whereas both showed a significant difference when compared with the controls. When the extent of the lesions was examined, however, it was found that the type of infection was the same in all groups, indicating that the effect of immunization with either the vole bacillus or BCG was simply to delay the progress of the infection.

II. The susceptibility of various South African wild rodents to the vole bacillus was investigated.

The most susceptible were the Cape gerbil, *Tatera afra*, and the Transvaal gerbil, *T. brantsii* (Muridae, Gerbillinae). Lesions were produced by the intraperitoneal inoculation of 0.01 mg. of culture. The progress of the disease was very slow; thus, at the 130th day no macroscopic

lesions were seen but later (218 days) gross macroscopic foci developed. The spleen was the first organ to become affected, but widespread lesions in the form of large caseous or haemorrhagic foci were found in the liver and lungs. Infection was also set up by the oral route. A striking feature was the enormous number of acid-fast bacilli with some resemblance to those causing leprosy.

The multimammate mouse, *Mastomys concha* (Muridae, Murinae), was also susceptible, lesions following the inoculation of 0.0001 mg. The disease was much more chronic than in the gerbil, some of the animals surviving for more than 600 days. In three out of the 17 most grossly affected, the lesions were practically confined to the lungs. The white-footed rat, *Mystromys albicaudatus* (Muridae, Cricetinae), was completely insusceptible. The gerbil (*Tatera*) was moderately resistant to virulent human and bovine strains of *Mycobacterium tuberculosis* and to *M. leprae*.

An extract of organs, muscle and blood from the gerbil incorporated in nutritive media enhanced the growth of the vole bacillus.—R. E. G.

SIGURDSSON, B., VIGFÚSSON, H., & THEODORS, S. (1945.) The serological diagnosis of Johne's disease of sheep.—*J. comp. Path.* 55. 268–276. 533

The authors describe results of complement fixation tests on 55 sheep in a flock heavily infected with Johne's disease. They used an antigen prepared as described by Sigurdsson [*V. B.* 16. 181] and compared the results obtained with intradermal johnin tests, using both P.P.D. johnin obtained from England and P.P.D. johnin prepared in Iceland.

The 55 sheep were slaughtered and minutely examined. Lesions of Johne's disease were found in 30 out of 31 sheep which had given positive reaction to the complement fixation test. In four others which had given positive reactions to the complement fixation test no lesions were found.

118 sheep from a farm free from Johne's disease were tested as controls and four gave weak positive results to the c.-f. test.

For the intradermal tests johnin containing either 3 or 4 mg. of dried P.P.D. per ml. was used. Of 39 sheep in the infected flock which were tested with johnin only about 50 % of those which were proved to be infected on P.M. examination reacted.

Sera from a number of active human cases of TB. or leprosy reacted positively to the c.-f. test with the johne's antigen, indicating that the antigen is not specific.

The history of the introduction of Johne's disease into Iceland by Karakul sheep imported from Germany in 1933 is briefly outlined.—M. C.

FORTNER, J., & DINTER, Z. (1944.) Ist das Rotlaufbakterium der alleinige Erreger des Schweinerotlaufs? [Is *Erysipelothrix rhusiopathiae* the sole cause of swine erysipelas?]—*Z. InfektKr. Haustiere.* 60. 157–179. 534

The authors carried out experiments to test KÖBE's claim [*V. B.* 14. 202] that the virus of a swine gastro-enteritis was present in the tissues of pigs with swine erysipelas, with the result that pigs inoculated with tissue suspensions from infected pigs developed swine erysipelas whereas pigs inoculated with *Erysipelothrix rhusiopathiae* did not. Pigs were inoculated subcutaneously or intradermally with organ extracts of infected pigs, filtered organ extracts and pure cultures of the bacillus of swine erysipelas. The filtered organ extracts failed to produce the disease, and animals which had been previously treated with them reacted normally to inoculation with pure cultures of the bacillus. Unfiltered organ extracts produced the disease even after the material had been stored many weeks at 0°C. in 50 % glycerin. Pure cultures of the bacillus also produced the disease. It is concluded that *E. rhusiopathiae* alone is the cause of the disease, and that no virus is essentially involved.—U. F. RICHARDSON.

McNUTT, S. H., & LEITH, T. S. (1945.) Studies in swine erysipelas.—*M[ich.] S[t.] C[oll.] Vet.* 5. 97–103 & 124. 535

Agglutination tests for *Erysipelothrix rhusiopathiae* infection were conducted mainly in a large piggery averaging 800–1,000 head using the technique of GREY *et al.* [see *V. B.* 11. 837] and of KARLSON & McNUTT [see *V. B.* 9. 866] were used with very little disagreement in the results. Reactors were disposed of. After the lapse of two years (1940–1942), during which several tests had been carried out, the incidence of clinical cases and of new reactors gradually became insignificant. In May, 1944, however, after heavy rains, eleven new reactors were detected. The sharp increase that followed (37 reactors in the second half of 1944) is ascribed to this fact. In these eleven reactors, the origin of the infection is assumed to have been extraneous. The authors believe that swine erysipelas is spread mainly through chronic carriers. They suggest that the importance of the soil may have been over-emphasized. The aggl. test detects the chronic cases and is a means of control.—M. L. LEVI.

*RISLAKKI, V. (1942.) Beobachtungen über die Pseudotuberkulose einiger Nagetiere und Füchse. [Pseudotuberculosis in rodents and foxes.]—*Suom. Eläinlääkärit.* 48. 182–193. [Abst. from abst. in *Zbl. Bakt. I. (Ref.)*. 144. 25.] 536

Pasteurella pseudotuberculosis infection, which

has been diagnosed in beavers, nutria and silver foxes in Finland since 1935, seems to have a tendency to die out on a farm.—J. ZWEIG.

YU, S. J. (1942.) [Report on prophylactic measures against swine plague (pasteurellosis) in Southern Szechwan.]—*J. Szechwan agric. Res. Sta.* 4. No. 6, 7 & 8. 153-156. 537

Polyvalent vaccine prepared locally was used in this test. Two injections, with an interval of one week, were made subcutaneously in the flank or the back of the ear. The amount used for the first injection was 0.16 ml. per kg. body weight, while that of the second injection was 0.2 ml. per kg. body weight. Among the 364 pigs vaccinated only four reacted severely; one of them died six days later. Death was found to be due to swine erysipelas. The result was said to be fairly satisfactory.—S. J. CHU.

HANSMANN, G. H., & TULLY, M. (1945.) Cat bite and scratch wounds with consequent pasteurella infection of man.—*Amer. J. clin. Path.* 15. 312-318. 538

In three instances, cat bites produced severe local infection, from which identical organisms of the pasteurella group were isolated. The wounds became markedly swollen and painful, but there was no febrile reaction. Eventually a small abscess developed which yielded a Gram-negative, non-motile, bipolar, cocco-bacillus, having a serological relationship with *Pasteurella aviseptica*. Cultures given intraperitoneally or intravenously were pathogenic for mice, g. pigs and rabbits and H. advocates the use of such inoculation tests to differentiate pasteurella from the influenza bacillus in the examination of the bacterial flora of the respiratory tract. Several similar cases from the literature are reviewed.—J. KEPPIE.

*VEYRASSAT, J., & DELLA SANTA, R. (1943.) Les pasteurelloses par morsure de chat. [Pasteurellosis following cat bites.]—*Schweiz. med. Wschr.* pp. 1510-1512. [In French.] [Abst. from abst. in *Zbl. Bakt. I. (Ref.)*. 144. 515.] 539

The authors describe a case of infection in man following a bite from a cat. They believe it to have been due to a pasteurella, but were unable to isolate the organism.—J. ZWEIG.

BRION, A., & LUCAM, F. (1941.) Note sur une encéphalo-myéélite du chien due à un microbe voisin du pneumobacille. [Encephalomyelitis in dogs caused by an organism resembling Friedländer's bacillus.]—*Bull. Acad. vét. Fr.* 190-194. 540

Two dogs brought to the Veterinary School at Lyons had the following symptoms:—spastic paraplegia, absence of the Achilles tendon and plantar reflexes and of reflex reaction in the

posterior part of the abdominal wall, aphonia and hypothermia. One dog died; the other was destroyed. The only finding at autopsy was a gelatinous greyish-red exudate surrounding the spinal cord and base of the brain. The brain of one dog was examined bacteriologically and from it was obtained an organism which from its morphological, cultural and biochemical characters appeared to belong to the genus *Klebsiella*. The features which differentiated it from *Klebsiella pneumoniae* were production of indol, failure to reduce neutral red and certain fermentation reactions. No study of the serological reactions of the organism was made. The authors propose for the organism the name *Klebsiella encephalomyelitis*. Intracerebral inoculation of the organism in g. pigs produced paralysis when small doses were used: large doses were fatal within 24-48 hours. Intraspinal inoculation into a dog was followed by death within 24 hours and at autopsy a gelatinous exudate was found around the spinal cord and base of the brain.—E. G. WHITE.

WEISER, R. S., & HARGISS, C. O. (1946.) Studies on the death of bacteria at low temperatures. II. The comparative effects of crystallization, vitromelting, and devitrification on the mortality of *Escherichia coli*.—*J. Bact.* 52. 71-79. [Authors' summary amended.] [For part I, see *V. B.* 16. 343.] 541

Sucrose or gelatin dissolved in water gives a solution which can be cooled, by means of liquid nitrogen, so rapidly that there is not time for crystals to form. The solid state is described as "vitreous." The word "devitrification" is used for the slow change from solid to liquid through the crystallization range but if the solid is warmed rapidly the expression "vitromelting" is used for the resultant change.

Escherichia coli was suspended in 10 per cent sucrose and subjected to crystallization, vitromelting, and devitrification treatments at -195°C. The vitromelting treatment was found to be more lethal than the crystallization treatment. The devitrification treatment was more lethal than either the vitromelting or the crystallization treatment. The manner in which these results may apply to theories of the mechanism of the death of bacteria by freezing is discussed.

PEARCE, R. (1946.) Elimination of Gram-negative bacilli from cultures by treatment with ether. [Correspondence.]—*Lancet.* 250. 347-348. 542

The following method has been devised for the elimination of *Proteus* and other Gram-negative bacilli from cultures in which they grow in association with pyogenic cocci. The material under investigation is plated out and inoculated

into serum broth. If *Proteus* is present on the plates next day, about 0.2 ml. of the broth culture is pipetted into a sterile tube, an equal volume of ether added and the whole intimately mixed by violently filling and emptying the pipette nine times in rapid succession. The whole mixture is immediately spread uniformly on a blood agar plate and a second plate inoculated with a loop from the first to ensure separate colonies. The plates are examined after 24 hours', and if necessary after 48 hours' incubation. Results with cultures so far investigated are as follows.

Resistant to ether: haemolytic streptococci (four strains), *Staphylococcus aureus* (two strains), pneumococci (two strains), non-haemolytic streptococci (two strains), *Corynebacterium diphtheriae*, enterococcus.

Killed by ether: *Proteus vulgaris*, *Pseudomonas pyocyanea*, *Bacterium coli*, paracolon bacilli, *Salmonella typhi*, *Bact. flexneri*, *Bact. sonnei*.

—H. S. McTAGGART.

THOMEN, L. F., & FROBISHER, M., JR. (1945.)

A study of *Shigella* by means of bacteriophage.

—*Amer. J. Hyg.* 42. 225-253. [Authors' summary slightly amended.] 543

A review of the literature on the taxonomic status of the genus *Shigella* is presented. It is shown that confusion still exists and that a satisfactory method by means of which proper differentiation of species and races of organisms contained in this genus may be made is not available.

The phenomenon of specific adaptation of bacteriophage is described. A method using specifically adapted bacteriophages, similar to that devised by Craigie and associates for the typing of the typhoid bacilli, has been applied to the genus *Shigella* and the results are discussed in detail. "Nascent 'phage", as adapted by Evans for streptococci and by Wilson and Atkinson for staphylococci, was not used in this study, but bacteriophage suspensions free of living bacteria.

It was found that bacteriophages which would attack specifically the well defined species and races included in the genus *Shigella* can be developed from the ordinary lytic material obtained from chicken feces. It was possible to develop specific lytic agents of differential value for *Shigella dysenteriae*, *Sh. species* (Newcastle type), *Sh. ambigua*, *Sh. paradysenteriae* (V, W, X, Y, and Z), and *Sh. sonnei*. Against three of the species designated as "allied species" it was possible to develop bacteriophages possessing at least as high a degree of specificity and potency as bacteriophages lysing the true dysentery bacilli, and in some instances even higher. The latter are *Sh. alcalescens*, *Sh. madampensis* and *Sh. ceylonensis*. Bacteriophage specifically attacking allied species whose status in the genus *Shigella*

is dubious was not obtained, thus justifying the doubt concerning the propriety of their acceptance as members of the genus. These species are *Sh. gallinarum*, *Sh. pfaffi*, *Sh. rettgeri* and *Sh. douglasi*.

From a practical standpoint, the method of bacteriophage typing was found to be neither more accurate nor more sensitive than the serological tests or carbohydrate fermentation reactions at present in general use for the genus *Shigella*. However, it offers certain advantages over the latter two, as it is quicker, the bacteriophage adapting itself to a bacterial substratum in much less time than an animal can be immunized. It does not require a large number of different and complicated media, as carbohydrate tests do, and no laboratory animals are required, the bacteria being the experimental organisms. Once adapted to a certain species or race of bacteria, bacteriophage can be kept in the ice box, the same as is done with sera, and used at the convenient moment. It is to be noticed also that bacteriophage FG acts both upon smooth and rough cultures, thus avoiding the necessity, stressed in the studies upon bacteriophage typing of *Eberthella typhosa*, of maintaining the cultures in a Vi or smooth phase.

GARRARD, E. H. (1946.) **Coliform contamination of eggs.**—*Canad. J. Res. Sect. C.* 24. 121-125. 544

Qualitative tests were conducted on 1,080 eggs from hens infected with *Salmonella pullorum* during the months of July, August and September. It was not possible to determine whether any one hen consistently laid coliform-contaminated eggs as the birds were not trap-nested. Coliform organisms were recovered from 78 eggs and *S. pullorum* was recovered from 61 eggs. In only six cases, however, were *S. pullorum* and coliform organisms isolated from the same egg. A similar examination of 1,000 eggs from a pullorum-free group in October, November and December failed to yield a single coliform culture. In the first group, most of the coliform isolations were made from birds that reacted suspiciously or non-specifically to the agglutination test. It is suggested that the significance of this work lies in the indication that coliform types may be responsible for such reactions.—R. GWATKIN.

*STROZZI, P. (1942.) **[Food poisoning in cattle by *Salmonella typhi-murium*.]**—*Clin. vet., Milano.* 65. 195-201. [Abst. from abst. in *Wien. tierärztl. Mschr.* 30. 16-17.] 545

S. describes a case of food poisoning attributed to *Salmonella typhi-murium* in nine bullocks out of 20 which were fed an extra ration of oil-cake gruel, which had been made overnight and

left near a warm stove. All nine had fever, prostration and severe diarrhoea within six hours and four died within three days. Lesions found P.M. included haemorrhagic inflammation of the small intestines, a croupous inflammation of the large intestine with bloody contents and a fibrinous exudate, and epicardial ecchymoses. It is suggested that the meal was soiled by the excreta of mice and that rapid multiplication of the organisms occurred in the warm gruel.—R. A. R.

SCHMIDT, H. (1942.) Die Bedeutung der Antigenstruktur der Salmonellabakterien für deren Agglutination durch H-Ionen. [Importance of antigenic structure of salmonella for agglutination by hydrogen ions.]—*Hoppe-Seyl. Z.* 274. 129-148. 546

S. studied the relationships between agglutination by hydrogen ions and the antigenic structure of bacteria of the salmonella group, using buffer solutions with a pH of 2.2-4.7. The bacteria, suspended in distilled water, were tested unheated, heated, and heated and washed. The supernatant fluid was also examined. In addition, bacteria treated with N/10 HCl, digested with trypsin and extracted with trichloroacetic acid were used.

It was found that two optima of agglutination by hydrogen ions occur, one at 4.2-4.7 and the second one at 2.2-2.4. The first reaction depends on the presence of the H antigen. Some authors suppose that the Vi antigen is responsible for the second reaction, yet Vi and O antigens both have an inhibitory effect on this agglutination. In the present investigation it was not possible to decide whether agglutination in the pH 2.2-2.4 region depended on the Vi or the R antigen. S. points out that the experiments with HCl-treated, trypsin-digested and trichloroacetic acid-extracted bacteria have so far not been conclusive and should be repeated on a larger scale.—E. K.-N.

EDWARDS, P. R. (1945.) Form variation in Group C salmonella strains.—*Proc. Soc. exp. Biol., N.Y.* 59. 49-52. 547

E. demonstrated that the somatic antigen VI₁ is subject to reversible form variation, similar to those for antigens I and XII₂. Colonies which were deficient in VI₁ had a normal content of VI₂.

—A. BUXTON.

FULTON, M. (1945.) *Salmonella* grouping for the average laboratory.—*J. Bact.* 50. 117-118. 548

F. indicates the antisera required by a clinical laboratory for the grouping of salmonella cultures and emphasizes that for complete typing, such cultures should be submitted to a recognized Salmonella Typing Centre.—A. BUXTON.

SELIGMANN, E., SAPHRA, I., & WASSERMANN, M. (1945.) A heretofore undescribed phase-

variation in salmonella.—*Proc. Soc. exp. Biol., N.Y.* 58. 48-50. 549

The authors examined a strain of *S. typhimurium* in which the specific flagellar antigen (i) could not be demonstrated by colony dissociation. When not in the 1,2,3... phase the organism remained motile but was inagglutinable. By growing this inagglutinable phase of the organism in the presence of suitable antisera, however, both the 1,2,3... and i phases were demonstrated.

—A. BUXTON.

HUDDLESON, I. F. (1946.) The mucoid phases of the genus *Brucella*.—*Amer. J. vet. Res.* 7. 5-10. 550

H. describes dissociation of oblique light. After growth of S phase organisms in tryptose broth for ten days, subcultures are made on tryptose agar plates so that well separated colonies are obtained. These are examined after four days' incubation when colonies of the S, intermediate or R phase and some mucoid colonies sometimes appear. The various phases are described. Three mucoid or wax-like phases have been obtained from *Br. abortus*, two from *Br. suis*, and one from *Br. melitensis*. One mucoid phase of *Br. abortus* and those of *Br. suis* give rise to daughter colonies which are similar in many respects to S phase colonies. The mucoid or mucoid-daughter colonies are not pathogenic for g. pigs or cattle.

Mucoid and mucoid-daughter cells when injected into g. pigs give rise in their blood serum to specific growth-inhibiting antibodies in high titre and confer a high degree of immunity.

—S. J. GILBERT.

BUDDLE, M. B. (1945.) Progress in the control of contagious abortion in New Zealand by vaccination.—*Aust. vet. J.* 21. 122-129. 551

Of more than ten thousand heifers vaccinated with strain 19 *Brucella abortus* vaccine as calves at over four months of age, 3% aborted from all causes after the first mating. 22% of over 11,000 unvaccinated heifers in the same herds aborted after the first mating. Forty-three thousand heifer calves were vaccinated with strain 19 in New Zealand in 1944 and 107,000 in 1945.—D. C. BLOOD.

SCHMID, G. (1945.) Die Impfung von Kühen mit Abortus Bang-Vakzine Buck 19. [Inoculation of cattle with *Brucella abortus* strain 19.]—*Schweiz. Arch. Tierheilk.* 87. 188-191. 552

Details are given of the effect of inoculation with strain 19 vaccine on subsequent pregnancy and on blood and whey agglutination titres in 20 non-pregnant cattle, of which ten were previously negative and ten positive to the aggl. test. No untoward results were observed.—E. COTCHIN.

HUTCHINGS, L. M., DELEZ, A. L., & DONHAM,

C. R. (1946.) **Studies on brucellosis of swine.**

II. Exposure and re-exposure experiments with *Brucella suis*.—*Amer. J. vet. Res.* 7. 11–20. [For part I, see *V. B.* 15. 143.] 553

Seven separate groups comprising 56 animals were artificially exposed or re-exposed to infection with *Br. suis* by intravenous, subcutaneous or oral routes. Of 19 sows re-exposed to infection, 13 became re-infected. No abortions occurred but one sow aborted in her next pregnancy and was found infected with *Br. suis*. Fifteen animals not previously exposed were artificially infected as controls and in all there were indications of infection; however none aborted. Six yearling pigs artificially exposed became infected and one aborted. Of five sows previously infected naturally, three became re-infected when fed with infective abortion materials. Other experiments of a similar type are described.

Indications were obtained that there is some degree of resistance present in swine previously exposed to *Br. suis* but it is not sufficient for them to be classified as immune.—S. J. GILBERT.

CAMERON, H. S. (1946.) **Brucellosis of swine.**

IV. The unit-segregation system of eradication.—*Amer. J. vet. Res.* 7. 21–26. [For parts II & III, see *V. B.* 15. 225.] 554

IV. The agglutination test is not a reliable means of diagnosing brucellosis in individual pigs, but is an effective guide to the presence of brucella when a whole herd is tested. Infected sows recover if not subjected to re-infection.

A unit segregation system for eradicating the disease is described. The system is based on the fact that young pigs are not usually infected at weaning and on the efficiency of the aggl. test when applied to the herd. Testing is reduced to a minimum and valuable animals may be salvaged from the positive unit. A herd of negative-reactors can be obtained in one year.—S. J. G.

LISBONNE, M. (1946.) *Recrudescence générale de la fièvre ondulante dans le midi de la France. Inefficacité de la vaccination animale; nécessité d'une "politique" antimélistique. [The increase of *Brucella melitensis* infection in the South of France: the ineffectiveness of animal vaccination and the need for a control policy.]*—*Lait.* 26. 21–25. 555

L. describes a severe endemic of brucellosis in human beings occurring in southern France. The demand for goats greatly increased owing to the shortage of cows' milk and many of them were infected with *Br. melitensis*. L. suggests measures of control that should be taken, condemning the use of avirulent *Br. abortus* vaccines. The use of vaccines for human beings also proved unsatisfactory and in the opinion of the author legislation

prohibiting sale of goats without serological test and goat cheese from unpasteurized milk and slaughter of all infected goats is urgently required.

—S. J. GILBERT.

RECORDS, E., & VAWTER, L. R. (1945.) **Bacillary hemoglobinuria of cattle and sheep (red water disease).**—*Tech. Bull. Nev. agric. Exp. Sta.* No. 173. pp. 48. 556

The authors give an excellent review of the present knowledge relating to bacillary haemoglobinuria [*Clostridium haemolyticum* infection] as it occurs in certain parts of the U.S.A., dealing with all aspects of the disease under such headings as clinical symptoms, P.M. appearance, differential diagnosis, pathogenesis and prevention. In certain lowland pastures subject to periodic flooding the disease is a grave menace to grazing cattle and occasionally to sheep: one outbreak has been described in pigs. The disease is typically a peracute, febrile toxæmia and must be differentiated from other conditions such as anthrax, and, it is stated, cystitis and bracken poisoning.

The characteristic P.M. changes include generalized icterus, petechial haemorrhages and single large necrotic infarcts in the liver, this being the primary lesion as it appears early in the infection and contains large numbers of *Clostridium haemolyticum*.

This organism is an obligate anaerobe which in cultures is exacting in its requirements. Beef liver digest medium or cooked liver medium plus thioglycollic acid are recommended. Unless newly isolated cultures are kept in the frozen state they lose their virulence and certain other characters. All the cultures have been shown to have the same antigenic structure and toxins. The haemolytic toxin reaches its maximum within the first 20 hours of growth and thereafter rapidly disappears, whereas the necrotoxin persists. Whole culture readily infects animals if its content of haemolytic toxin is sufficiently great. The circumstances in which the primary infection in the liver occurs have not been established. Experimental infestation of cattle with liver fluke cercæ and *Cl. haemolyticum* cultures *per os* failed to provoke the disease. The intravenous administration of antitoxin is successful in the treatment of suitable cases and the disease can be prevented by the annual injection of the aluminium hydroxide precipitate from young formol-killed culture.—J. KEPPIE.

BREED, G. B. (1945.) ***Clostridium parasporogenes*, an invalid species.**—*J. Bact.* 49. 503–505. 557

McINTOSH (1917) first differentiated between *Cl. sporogenes* and *Cl. parasporogenes*, the latter differing only in its formation of entire, smooth colonies, as opposed to the rhizoid colonies pro-

duced by *Cl. sporogenes*. Since this time the species has been neglected, so that R. could trace only two type strains, both lineal descendants of McIntosh's. On subculture these gave rise to both smooth and rhizoid colonies, the latter being indistinguishable from *Cl. sporogenes*.

Cross-agglutination tests with serum produced in rabbits revealed distinct antigenic differences, but these were no more than between the R and S forms of many organisms.—R. M. A.

SEIDENSTÜCKER, H. (1943.) Beeinträchtigte Einfrieren die weitere Verwendbarkeit des Tetanusheilsersums? [Does freezing harm tetanus antitoxin?].—*Dtsch. med. Wschr.* 69. 448-449. 558

A tetanus antitoxin was tested which had been exposed previously to temperatures of 35°-40°C. below zero repeatedly in the course of the campaign in Russia. It was compared with two other active sera in mouse experiments and in the ring precipitation test described by HOEN & TSCHERTKOW (1929). It was found that the antitoxin which had been exposed to repeated freezing and thawing was still active.—E. KLIENEGERGER-NOBEL.

LAMANNA, C., EKLUND, H. W., & MCELROY, O. (1946.) Botulinum toxin (Type A); including a study of shaking with chloroform as a step in the isolation procedure.—*J. Bact.* 52. 1-13. [Authors' summary and conclusions copied verbatim.] 559

A method for purifying and crystallizing type A botulinus toxin has been discussed.

Extraction of the toxin from an acid precipitate of whole culture is determined by the pH of the extracting solvent. The efficiency of extraction and the stability of the toxin are influenced by the concentrations of salts present. Shaking an extract of acid precipitate of culture with chloroform results in the formation of a protein gel. Depending on the pH and concentrations of salts present, the toxin is detoxified, or remains active and in solution, or remains active and composes a part of the gel. Shaking with chloroform at a high pH value (6.8+) results in detoxification with no equivalent loss in antitoxin combining power. During the shaking the pH changes, the direction and the extent of the change depending on the nature of the buffers present and the salt concentration. After being shaken with chloroform, toxin is recovered which is acid-precipitable in a new isoelectric range. A hypothesis to explain this finding is discussed.

Increasing the salt concentration seems to spread and lower the pH range of acid precipitation of the toxin at all stages of purity.

The pure toxin is a protein with the solubility properties of a globulin. An LD50 for the 20-

gram white mouse contains 4.5×10^{-9} mg. of nitrogen; there are about 32 billion intraperitoneal LD50 per gram of dry toxin. On the basis of dry weight, the pure product is approximately 240 times more potent than the toxin in the original mother culture.

DEMnitz, A., & SCHEEPERS, G. (1944.) Das Hühnerei als Träger von Botulinuskeimen. [Botulism from hen's eggs.].—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 179-180. 560

In g. pigs injected with *Cl. oedematiens* toxin symptoms of botulism were observed, infection being traced to the egg albumen which was one of the components of the nutrient medium used in the preparation of the *Cl. oedematiens* toxin. Out of 41 batches of medium, the preparation of which involved the use of approximately 1,500 eggs, five proved to contain *Clostridium botulinum* Type B. Bacilli and spores of this organism were found adhering to the shell of certain eggs, the authors assuming that this was a result of contamination during the passage of the egg through the cloaca, presumably derived from the intestinal contents. The interior of the egg was invariably free from pathogenic anaerobes, but it seemed that during the breaking of the shell and the separation of yolk and albumen, the latter had become contaminated with *Cl. botulinum* organisms, the spores of which survived the sterilization processes used in preparing the *Cl. oedematiens* toxin.—E. M. CRUICKSHANK.

LAHELLE, O., & THJÖTTA, T. (1945.) A systematic study of *Fusobacterium* and *Necrobacterium* (i.e. *Actinomyces necrophorus*, *Nekrosebacillus* Bang) as to their biological relationships and proposal of a new and adequate name for the latter.—*Acta path. microbiol. scand.* 22. 310-322. [In English.] 561

A short survey is given of the literature relating to *Fusobacterium* and *Fusiformis necrophorus*. The authors investigated certain of the properties of both organisms, using five strains of the former and 20 strains of the latter bacillus.

It was found that the two organisms had many similar properties, both of them showing a common morphology in that they were Gram-negative and non-sporulating; they were also anaerobic. However, although the biochemical reactions of *Fusobacterium* were generally similar to those of *Fusiformis necrophorus* all its strains fermented glucose and were unable to grow in peptone water. By agglutination and complement-fixation tests, a close serological relationship was shown between the two organisms. Unlike *Fusiformis necrophorus*, *Fusobacterium* was non-haemolytic and seldom showed any pathogenicity for laboratory animals.

It is proposed that *Fusiformis necrophorus* be renamed *Necrobacterium*.—J. C. BUXTON.

DUNCAN, J. T. (1945.) A survey of fungous diseases in Great Britain. Results from the first eighteen months.—*Brit. med. J.* Nov. 24th. 715-718. 562

During a period of 18 months, 1,094 specimens of mycosis or suspected mycosis in the human subject in Britain were examined for the Committee for Research in Medical Mycology (Medical Research Council). Of the fungi more closely related to animal pathology the following were of particular interest.

A disease spoken of as "farmer's lung" has characteristics somewhat similar to those of "broken wind" in the horse; it generally occurs after the patient has been in contact with mouldy hay and inhaled fungus laden dust. In several of these cases different species of *Aspergillus* were isolated. The exact role of the fungus in the disease is, however, obscure.

Pus from a case of cerebrospinal actinomycosis in a human being yielded a culture of *A. bovis*. The disease began in the region of the temporal bone and was rapidly fatal. Two cases of *A. bovis* infection of the lung were investigated.

The organism was also isolated from a number of other lesions, as were aerobic actinomycetes. The value of penicillin in the treatment of actinomycosis caused by both aerobic and anaerobic species of *Actinomyces* was confirmed.

MYCOSES OF LOWER ANIMALS. "In addition to epiphytic infections, the naturally acquired deep mycoses of the lower animals, especially rodents, may be important in connexion with fungous diseases of man. Nearly all the grave systemic mycoses have been found in domesticated animals, but none of these animals can be regarded as a reservoir of infection. On the other hand, desert rodents are known to be the natural reservoir of coccidiomycosis, and rodents have been suspected in connexion with histoplasmosis. Rats and mice are susceptible to artificially induced infection by many pathogenic fungi. It was hoped, therefore, that material from wild rodents would have been obtained for examination, but none has been forthcoming up to the present time. Two pathologists sent sections of tissue which showed mycoses of the kidney in laboratory rabbits, but in the absence of cultures the genera of the infecting moulds could not be determined. Many specimens were received of aspergillosis of birds in captivity, from all of which *Aspergillus fumigatus* was isolated. This ubiquitous fungus invades the air system and lungs and frequently the solid organs of birds in captivity, but the disease is almost unknown in birds in the wild state. The fungus is commonly

present on grains and seeds, but diving birds are affected as well as seed-eaters, and it seems probable that the infecting form of the fungus is the mycelial growth vegetating in stale drinking or other water, which gains entry through the nostrils".

The incidence of ringworm in human beings in different parts of England during the period is discussed. In one area a peculiar strain of *Microsporon felinum* caused a series of sporadic cases in children over a period of a few months, but in no instance did the history indicate infection from another child. *M. lanosum* and *M. felinum* are transmitted chiefly from child to child, but it seems probable that frequent renewals from the animal reservoir of the infection are necessary for the propagation of this kind of ringworm among children. How long this disease can be transmitted as a child-to-child infection without renewal from the animal reservoir was not determined; in one instance, in about one-fourth of the *M. lanosum* infections there was a history of a possible contact with an infected dog or cat. In one series it was observed that the skin lesions on children infected directly from an infected animal were more severe than those resulting from the first subsequent child-to-child transmission; this might suggest an early attenuation of the fungus. Lesions of the scalp caused by animal microsporons were, on the whole, more acute and showed a greater epidermal reaction than those caused by *M. audouini*, but inflammatory reaction was rare, and only one rather doubtful kerion caused by *M. felinum* was reported. Infection of the glabrous skin by animal types occurred, with or without associated tinea capitis. It is not always possible, except in the presence of severe skin lesions, to distinguish the human from the animal types of microsporiasis by clinical inspection alone.

Strain peculiarities were shown in cultures of some species, especially *M. felinum* and *M. audouini* and were useful in tracing the distribution of an infection.

THE SMALL-SPORE AND LARGE-SPORE ECTOTHRIX (ANIMAL) TRICHOPHYTONS. *Trichophyton asteroides* was isolated from skin lesions in adults, children and even babies. The suspected animal sources of contact were horses, dogs, cats and rodents (white mice). In other cases infection was attributed to handling hides, rubbing against a farm gate post and falling in a farmyard. *Trichophyton discoides*, the common cause of cattle ringworm, was found in many cases, all of which had been in contact with calves.—D. D. OGILVIE.

SALAMAN, M. H., *et al.* (1946.) The isolation of organisms of the pleuropneumonia group from the genital tract of men and women.—J.

Path. Bact. 58. 31-35. [Authors' summary copied *verbatim*.] 563

Organisms of the pleuropneumonia group (L organisms) have been isolated from inflammatory exudates in the genital tract of both men and women. In both, they are commonly found in gonorrhoea (34 per cent. in men and about 60 per

cent. in women) and in women they are common also in *Trichomonas* vaginitis and in non-specific cervicitis. They are much less commonly found in cases of the troublesome non-specific urethritis of men and are uncommon in prostatitis. They are found in a small proportion of apparently healthy men and women.

See also absts. 575 (strangles), 591 (*S. pullorum*), 637 (bacteraemia in puerperal diseases), 638 (cocci in healing burns), 641 (*S. cholerae-suis*, vibrios and *Actinomyces necrophorus* in swine), 644 (actinomycosis), 679 (faecal flora of rats), 680 (mastitis), 681 (anthrax), 682 (TB.), 683 (swine erysipelas (*Proteus vulgaris*), 706 (coliform bacilli), 710 (*S. berta*), 711 (*S. montevidео*), 713 (*Cl. welchii*), 736 (inherited susceptibility to TB.).

DISEASES CAUSED BY PROTOZOAN PARASITES

DESCHIEENS, R., & LAMY, L. (1946.) Étude morphologique des *Giardia* du mouton et des ruminants. [The morphology of species of *Giardia* from ruminants.]—*Ann. Inst. Pasteur.* 72. 95-104. 564

Morphological and biometrical studies were carried out on *Giardia ovis* of the sheep. Measurements of the length and breadth of the trophozoites and their relation to one another were estimated. The length averaged 12.1μ and the breadth 7μ giving a length to breadth ratio of 1.64. Three morphological types were recognized: short, medium, and long. A comparative study of *Giardia ovis* with other species observed or described in other ruminants, i.e., *Giardia bovis* of the ox, *G. caprae* of the goat, does not point to the existence of distinct species. Cross-infection experiments between the three host animals and further morphological data are necessary before the question of specificity can be decided.

—C. HORTON SMITH.

COUET. (1944.) Coccidiose des veaux à la mamelle. [Coccidiosis in unweaned calves.]—*Rec. Méd. vét.* 120. 168-169. 565

Coccidiosis appears in unweaned calves during the third to sixth weeks of life. C. has not been observed in calves younger than two weeks of age. The disease is at first marked by slight diarrhoea. Strings of bloody mucus appear at the end of 24-48 hours. The diarrhoea becomes more intense, blood clots appear and then tenesmus. Animals rapidly become emaciated. Infection is believed to take place by the ingestion of infected litter, or *via* the teats which may have become contaminated with faecal matter. Quinacrine and sulphathiazine [? sulphathiazole] have been tried in treatment.—C. HORTON SMITH.

*VAN DER MEER, G., & BRUG, S. L. (1942.) [Pneumocystis infection in man and animals.]—*Ned. Tijdschr. Geneesk.* 86. No. 33. [Abst. from French version in *Ann. Soc. Belge méd. trop.* 22. 301-307. (1942).] 566

The appearance of the parasite as seen in smears and sections from the lungs of a three-years-old child is described, including a descrip-

tion of forms which are considered to be stages in the developmental cycle. These are illustrated by photomicrographs.

Various animals including g. pigs, rats, mice, rabbits, foxes and sheep were examined for *Pneumocystis* and infected animals were found among the g. pigs, mice and rats.

The forms seen in the material from the animals were the same as those seen in the lung of the child. The classification of *Pneumocystis* in the coccidia is questioned.

MITSCHERLICH, E. (1944.) Ueber die intrauterine Uebertragung von *Babesia canis*. [Intrauterine transmission of *B. canis*.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* April 14th. 125-126. 567

No babesial infection developed in four pups littered by a bitch which had recovered clinically from *B. canis* infection acquired several months previously. The mother was shown to be still harbouring the parasite and the pups were susceptible on inoculation.—U. F. RICHARDSON.

LEWIS, E. A., PIERCY, S. E., & WILEY, A. J. (1946.) *Rhipicephalus neavei* Warburton, 1912 as a vector of east coast fever.—*Parasitology.* 37. 60-64. 568

A strain of *R. neavei* was raised from engorged females sorted out from a mixed collection of various species of *Rhipicephalus* collected in the field. East Coast fever was successfully transmitted by these ticks between the larval and nymphal stages and between the nymphal and adult stages and the infection was shown to persist in unfed adults for more than 260 days. No infection was obtained with the progeny of infected females.

The larvae of *R. neavei* did not feed on cattle as successfully as did the larvae of *R. appendiculatus* and it appears that cattle are not always suitable hosts. For this reason *R. neavei* is probably not as important a vector of E.C.F. as *R. appendiculatus*, but it must be assumed that under favourable conditions it can maintain and spread the disease. The distribution of *R. neavei* in East Africa is discussed and it is pointed out that there is evi-

dence that E.C.F. does not exist in many of the areas in which the tick occurs. It is suggested that there may be some agency other than the tick which governs the development and transmission of *Theileria parva*. ZUMPT [V. B. 13. 131] considers that *R. neavei* is an atypical form of *R. appendiculatus*, but the authors consider that the ticks are morphologically distinct, although closely allied biologically.—U. F. RICHARDSON.

BEUVERY-ASMAN, A. (1940.) De beteekenis der seroreactie bij honden met betrekking tot leptospireninfecties. [The significance of the serum reaction in dogs with relation to leptospira infections.]—*Tijdschr. Diergeneesk.* 67. 799–805 & 806. [English, French and German summaries.] [Abst. from English summary.] 569

Over 40% of 280 dogs chosen at random reacted positively to the agglutination test for leptospira, the titres varying from low to high. Twice as many were positive for *L. canicola* as for *L. icterohaemorrhagiae*. Sera from 47 cats did not react but this was not thought to preclude the possibility of later infection.

See also absts. 616, 685, 686 (trypanosomes), 687–690 (malaria).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

ANON. (1943.) Abteilung für Virusherstellung der Staatlichen Tierärztlichen Forschungsanstalt in Rotterdam. [Establishment for virus production at the State Veterinary Research Institute, Rotterdam.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 370. 571

This is an account of the ceremonial opening in some spare buildings at Rotterdam abattoir of an establishment for the production of the raw material (virus) for vaccines against foot and mouth disease. Large numbers of cattle are artificially infected and viruses of each type are harvested for dispatch to the F. and M. disease research institute at Amsterdam, for transformation into vaccine of the Waldmann type.—J. E.

IONESCU, D. (1944.) Untersuchungen über die natürliche Immunität bei der Tollwut. [Natural immunity against rabies.]—*Zbl. Bakt. I. (Orig.)* 151. 254–260. 572

Two sheepdogs and one goat resisted the intracerebral inoculation of fixed rabies virus. The first dog resisted two such inoculations but reacted to the third and the second dog and the goat reacted to the fourth inoculation only. After death, no rabies virus was recovered by rabbit inoculation from the brain of the second dog, but virus was recovered from the first dog and the goat.

Coincident with the inoculation of the dogs

The serum titres of dogs during infection and recovery rose to a maximum in 4½–7 weeks and then decreased slowly. Positive titres sometimes persisted for years.

OTTOSEN, H. E. (1941.) Om Leptospiainfektion hos Rotter. [Leptospira infection in rats.]—*Maanedsskr. Dyrlæger.* 53. 173–181. 570

Pieces of kidney from 685 rats were inoculated into Korthof's medium, and after incubation for 5–6 days, preparations were microscopically examined under dark-field illumination. In 33% of the cultures leptospira were found, i.e., in 25% of the young rats, in 36.3% of adult rats and in 32.4% of old rats. The incidence was a little higher in the months of October–January. A serological investigation of 127 strains, and virulence tests of 112 strains on g. pigs indicated that the organisms were *L. icterohaemorrhagiae*. Perivascular infiltrations were found both in infected and in uninfected kidneys. Fourteen infected kidneys stained with Levaditi's stain had leptospira in the lumina of the convoluted tubules, but never in the interstitial tissues.—H. C. B.

with virus there was an increase in the number of circulating eosinophiles except in the case of the last and infecting inoculation. The *in vivo* action of the tissues and cells of the immune dogs was studied by means of small glass capsules containing a virus suspension and having capillary openings. These enabled the contents of the capsule to come in contact, without escaping, with the surrounding tissue. These capsules were inserted subcutaneously and intracerebrally for 15 min. into two normal, two vaccinated and the two naturally immune dogs. Virus was recovered from the capsules in every case except from those inserted intracerebrally into the naturally immune animals. In this case the cellular content of the capsules consisted of large numbers of leucocytes. An *in vitro* viricidal action of the leucocytes of the naturally immune animals was also demonstrated.

—W. M. HENDERSON.

*LAMA, A. (1942.) Tentativi di vaccinazione contro la rabbia con ipovirus rabido formalizzato. [Rabies vaccination with formalized virus.]—*Boll. Sez. ital. Soc. int. Microbiol.* 14. 13–14. [Abst. from abst. in *Zbl. Bakt. I. (Ref.)* 144. 4–5.] 573

Good results are claimed from use of a formalized rabies vaccine given subdurally into rabbits and g. pigs.—J. ZWEIG.

AUDI, S. (1945.) Patološko-anatomska i paro-

ložkohistološka slika grudne zaraze konja. [Pathological anatomy and morbid histology of contagious pneumonia in horses.]-*Vet. Arhiv.* 15. 67-86. [Abst. from German summary.] 574

In Croatia, equine contagious pneumonia was prevalent during 1911-12 and again, but to a lesser degree and with a lower mortality, in 1942-43.

In the Faculty of Veterinary Medicine of the Croat University, Zagreb, during the two years previous to writing, 17 horses out of 83 examined P.M. were found to have been affected with the disease. Material from ten of these cases was examined histologically.

In its pathological anatomical picture, equine contagious pneumonia appeared to be a croupous inflammation of the lungs, together with an exudative, sero-fibrinous inflammation of the pleura and oedematous infiltration of the interlobular septa in the affected areas. The inflammatory process appeared to start deep in the lobe of the lung in the hilar area whence it spread to the surface and borders. The term "lobar pneumonia" was not thought suitable for the condition, since the inflammation was never found to have spread over a whole lobe as is usual in pneumonia in human beings. In no case was pus found in the thoracic cavity. Neither necrotic sequestrae nor cavernization, as described in the literature, were present.

EBERBECK, E., & HEMMERT-HALSWICK, A. (1944.) Zur Anämie als Folgeerscheinung des ansteckenden Katarrhs der Luftwege oder der Drüse des Pferdes. [Anaemia following infectious bronchitis or strangles of the horse.]-*Arch. wiss. prakt. Tierheilk.* 78. 473-488. 575

This is a discussion, with numerous citations of the literature, on the problem of whether a form of anaemia often seen in army horses which have previously been affected with infectious bronchitis or strangles is or is not equine infectious anaemia. In both types of anaemia, all the haematological and pathological characters are indistinguishable; if the possibility of the disease being E.I.A. is not eliminated, the animals become subject to the restrictions in force against E.I.A.

The authors conclude that post-bronchitis anaemia is distinct from E.I.A. The problem is very complex and influenced by the fact that *Salmonella abortus-equi* infection, which has a marked injurious effect on the haemopoietic tissues, is likely to cause death in horses affected with infectious bronchitis, etc. Streptococcal infection and nutritional factors also have an influence.

It is important that treatment of horses with infectious bronchitis and strangles be thorough in order to prevent secondary anaemia.—J. E.

OLITSKY, P. K., MORGAN, I. M., & SCHLESINGER,

R. W. (1945.) Vaccination with various western equine encephalomyelitis viruses; comparison as antigens and as test inocula.—*Proc. Soc. exp. Biol., N.Y.* 59. 93-97. 576

Vaccination of mice and g. pigs with various strains of Western E.E. virus produced satisfactory immunity to strains other than the Rockefeller Institute (R.I.) strain. The experiments reported here were made to select strains both for immunogenic and challenge purposes. The vaccines used were 10% chick embryo suspensions inactivated with 0.1-0.4% formalin. The immunization procedure for mice varied from two doses of 0.1 ml. vaccine with an interval of one week to two courses of 3×0.1 ml. vaccine with an interval of one week. The challenge dose, in the form of serial dilutions of infected mouse brain, was given 14 days later to groups of vaccinated mice, by the intracerebral route.

Results showed that no matter which strain of the four tested was used in vaccine preparation, the resistance to three of the strains was approximately the same. To the R.I. strain, however, the resistance was either nil or much less than to the others. When two older samples of the R.I. strain which had been kept frozen since 1939 and 1941 were compared as challenge strains to the current R.I., which had had many more intracerebral passages in mice, it was found that the R.I. 1941 gave evidence of a higher degree of immunity in the vaccinated mice than the current strain, while with the R.I. 1939, almost as many mice remained healthy as with the strains other than R.I. The titre of the test viruses 1939, 1941 and current were 10^{-6} , 10^{-7} and 10^{-8} respectively, but as all dilutions were used on the challenge test, this is not the factor concerned in the result described.—J. B. BROOKSBY.

HODES, H. L., THOMAS, L., & PECK, J. L. (1946.) Complement-fixation and neutralizing antibodies against Japanese B virus in the sera of Okinawan horses.—*Science.* 103. 357-359. 577

In July, August and September, 1945, an outbreak of encephalitis occurred among natives and American service men on the island of Okinawa and the infective agent was found to be identical with Japanese B virus. Sera from nine horses on the island gave significant titres in the complement-fixation test with Japanese B virus and were negative to the test with Western and Eastern strains of E.E. A normal horse serum from Guam was negative with all three viruses.

Neutralization tests based on intracerebral inoculation of mice were made with pooled sera from Okinawan horses, mixing the sera with decimal dilutions of the Japanese B virus. The titre of the virus was reduced from 10^{-8} to $10^{-3.5}$ and 10^{-3} with two of the pooled sera tested.

The equine population thus seems to be implicated in some as yet undetermined way in the outbreak of Japanese B encephalitis.—J. B. B. MITCHELL, D. T., & LE ROUX, P. L. (1946.)

Further investigations into immunization of cattle against rinderpest.—*Onderstepoort J. vet. Sci.* 21. 7-16. 578

Experiments with goat virus on highly susceptible grade cattle in Northern Rhodesia at a temporary field station are described. The possible transmission of infection from reacting to susceptible cattle was the subject of four experiments. Infection was not transmitted to 13 contacts kept for three weeks in a small kraal with nine reacting cattle. Of 50 susceptible cattle kept on an open grazing ground with 75 reacting animals for a period of 19 days, eight had rises of temperature. The eight cattle proved to be susceptible when submitted to a test injection and blood from these cattle subinoculated into goats caused febrile reactions between the sixth and 13th days. The reactions were not considered to be due to rinderpest, but to some other virus. Unfortunately it was not possible to test for immunity to the disease the goats which had been subinoculated from the eight cattle. No clinical symptoms of rinderpest were observed in any of the in-contact cattle or goats.

Two cattle were drenched with 20 ml. and two inoculated subcutaneously with 10 ml. of fresh urine collected from cattle on the fifth day of reaction to goat virus. None of them reacted and all were proved to be susceptible by test inoculation 15 days later.

Faeces were collected from two cattle reacting severely with profuse blood-stained diarrhoea on the eighth day after infection with goat virus. The fresh faeces were given to two susceptible cattle by drenching in a dose of 10 ml. Another sample was filtered through a Berkefeld filter and the filtrate injected subcutaneously in 10 ml. doses into two cattle. One of the cattle drenched with fresh faeces reacted with fever and clinical symptoms of rinderpest and proved to be immune on subsequent test inoculation. The others did not show any reaction. From these four experiments it is concluded that while transmission by contact does not occur frequently it may occur by ingestion of food contaminated with faeces.

The duration of immunity following vaccination with a formol-glycerin vaccine alone and with vaccine plus goat virus was studied. The results indicated that after an interval of eight months the immunity conferred by a single injection of formol-glycerin vaccine had disappeared completely, even when three injections of formol-glycerin vaccine had been given the immunity was considerably diminished in some individuals.

When a reinforcing injection of goat virus was given nine months after triple vaccination, a durable immunity was produced. A single injection of formol-glycerin vaccine followed seven days later by an injection of goat virus proved satisfactory as reaction to the goat virus was not severe and a durable immunity developed. If the interval was less than seven days reactions were severe while if the interval exceeded seven days the immunity was not durable.

Tests were also made with a formol-glycerin vaccine prepared from cattle reacting to goat virus. This proved to be of lower antigenic value than when prepared from cattle infected with virulent cattle virus.

It was concluded that goat virus was too virulent for use on the type of cattle found in South Africa, that formol vaccine followed by goat virus seven days later appears to be of considerable promise, and that no dogmatic denial of the possible transmission of infection to susceptible cattle from cattle reacting to goat virus is justified. Under grazing conditions the danger may be remote but a positive transmission in one out of two cattle drenched with fresh faecal material proves it possible.—M. C.

DUNGAL, N. (1946.) **Experiments with jaagsiekte.**—*Amer. J. Path.* 22. 787-759. 579

Attempts were made to transmit *jaagsiekte* to normal sheep. Since infection was believed to take place by the respiratory tract, preliminary experiments were devised to eliminate other routes.

The results were completely negative when sheep were fed with faeces from sick animals, were exposed to *Melophagus ovinus* from affected sheep or were placed in contact with a sheep affected with *jaagsiekte*, whose head and neck projected through a hole so that no air-borne particles could be transmitted to the in-contact controls.

The respiratory method of transmission was established either by placing a normal lamb in a special compartment above the head of a sick sheep, so that the former was exposed to airborne particles only, or by collecting exhaled air from an affected sheep in a glycerol mixture which was subsequently injected by the intratracheal and intrapulmonary routes. In several instances typical *jaagsiekte* lesions were found P.M. Gradocol filtrates (0.9μ) prepared from the expired air of affected animals set up typical lesions of *jaagsiekte* in a proportion of inoculated lambs. Nevertheless, there were many failures both with unfiltered and filtered material; these are attributed by D. to the possible presence in *jaagsiekte* lesions of virus-neutralizing agents.

Attention was also directed to the possibility of transmission by some intermediate agent, par-

ticularly *Muellerius capillaris*. Infection was not induced by the injection of larvae from lungs from animals affected with the disease, nor by feeding lambs with snails which were carrying *Muellerius* larvae. On the other hand, the administration of a filtrate from affected lungs together with a culture of a pasteurized-type of organism to lambs previously treated by the ingestion of snails infested with larvae from *jaagsiekte*-free sheep resulted in typical pulmonary lesions in three out of eight animals.

In smears from lungs of animals with the disease, desquamated cells from alveolar epithelium and columnar cells from the bronchi contained numerous corpuscles which were discernible after treatment with Giemsa or Castaneda's stains.—R. E. GLOVER.

LUCAM, F. (1945.) Recherches sur une maladie du mouton vulgairement appelée "bouhite". [*"Bouhite," a chronic pneumonia of sheep.*]
—*Bull. Acad. vét. Fr.* 18. 114-128. 580

L. recognized three forms of ovine pneumonia, *viz.*, parasitic broncho-pneumonia, caseo-fibrotic broncho-pneumonia and a third form for which the name malignant pulmonary lymphomatosis is proposed. The latter is a chronic disease confined to adult animals and lasting 12-18 months: it is invariably fatal. The main symptoms are respiratory distress and a progressive loss in condition. At P.M. examination the lungs have numerous greyish-yellow nodules 1-3 cm. in diameter. Histologically, the most characteristic feature is the formation in the interstitial tissue of masses of large round cells identified as lymphoblasts and usually surrounded by a ring of lymphocytes. As a rule, the lesion is distinctly neoplastic in appearance, but occasionally inflammatory changes are seen in which case the nodules resemble the lesions of TB. In sections stained by Giemsa, cytoplasmic inclusion bodies may be found, but they are comparatively rare and are not diagnostic.

Attempts to transmit the condition by close contact of infected and normal sheep were negative: the inoculation of normal animals with infective tissue was also without result.

L. discusses the possibility that the morbid process is the result of irritation by turpentine-like substances from the pine trees, common in the area where the disease occurs. It is suggested that the sheep may drink rain water from the cups attached to the trunks to collect the resin.

—R. E. GLOVER.

MCLEAN, I. W., JR., BEARD, D., TAYLOR, A. R., SHARP, D. G., & BEARD, J. W. (1945.) **Antibody response of swine to repeated vaccination with formalin-inactivated purified swine influ-**

enza virus.—*Proc. Soc. exp. Biol., N.Y.* 60. 152-159. 581

This is a continuation of work reported earlier [*V. B.* 16. 142] in which rapid decline of the antibody level in vaccinated swine was studied. A second inoculation of vaccine at six weeks was found to be followed by a maximum titre of antibody eight times as high and the decline in level was twice as slow. The present study concerns the optimum time of administration of the second dose of vaccine. Four groups of 16 pigs were used and vaccine and antibody estimation were made as in the previous series of experiments. Intervals of 1-4 weeks were left between the two doses of vaccine and it was found that as this period increased, the maximum antibody titre increased less than two-fold, greater total amounts of antibody were formed and the maintenance of the titre was prolonged. It is considered that a three-week interval is best, as a useful antibody level is still present as a result of the initial vaccination.—J. B. BROOKSBY.

DUBIN, I. N. (1945.) **A pathological study of mice infected with the virus of swine influenza.**
—*Amer. J. Path.* 21. 1121-1141. [Author's summary copied *verbatim*.] 582

The intranasal inoculation of mice with the virus of swine influenza produced necrosis of the lining of the bronchi and alveoli and to a lesser extent of the lower portion of the trachea. The necrotic epithelium often appeared in the form of a hyaline membrane. Even before the necrotic process had ended, proliferation of the epithelium began and reached a remarkable degree in the bronchi and bronchioles. From the latter the proliferating epithelium invaded and filled the alveoli. Many of these intra-alveolar plugs of epithelium apparently began to degenerate about the 14th day and some alveoli were thus partially reopened. The epithelium of the bronchi and bronchioles was restored to normal sometime during the 3rd week.

In addition to bronchitis, there was a pneumonia characterized by hyaline necrosis of alveolar cells, congestion with focal hemorrhage, marked edema, and interstitial infiltration of inflammatory cells, chiefly mononuclear cells. Large areas of lung collapsed as early as the 2nd day, subsequent to obstruction of bronchi by pus, mucus, and desquamated cells. Most deaths occurred on the 4th day, mainly from asphyxia resulting from the pulmonary changes.

Lesions were restricted to the trachea, bronchi, and lungs. In particular, no changes were found in the nose or brain.

The lesions were essentially similar to those reported by others as occurring in mice following

the intranasal inoculation of the virus of human influenza.

NIGGE, K.-H. (1944.) Die Gewinnung und Untersuchung des Liquor cerebrospinalis beim Hund mit besonderer Berücksichtigung der Liquorbefunde bei der Hundestaupe. [Collection and examination of cerebrospinal fluid of dogs, with special reference to distemper.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 26-29. 583

Cerebrospinal fluid was collected from 55 dogs, of which 25 had normal central nervous systems. In nearly all cases withdrawal was by occipital puncture, without general narcosis. The technique is described in detail: it offered little difficulty. 10-30 drops of fluid drained off spontaneously and more was withdrawn with a syringe. The fluid was examined for quantity, colour, total protein and number of cells per cu. mm. and the cells were differentiated by a smear technique.

The fluid from normal dogs looked like water, had a low globulin content and total protein content up to 16 mg. %. Large and small lymphocyte cells were present (16 per ml.). Pathological fluid from dogs with distemper looked like water or was opaque in varying degrees. The globulin reaction was positive in many cases, varying from slightly opalescent to cloudy; the total protein increased up to 50 mg. % and the cell number amounted to 16 per ml. for most dogs with nasal discharge. In four cases macrophages were found.

Apart from animals with diseased central nervous systems, it was noteworthy that there were always changes in the fluid if the dogs had purulent nasal discharge and that in two cases symptoms of encephalitis appeared soon after the appearance of a severe pleocytosis. N. suggests that possibly in distemper encephalitis, as in the Borna disease of equines, the lymph routes accompanying the olfactory nerve are involved in the transference of infection to the brain.—K. J. S.

GREEN, R. G. (1945.) Zoologic and histologic modification of the distemper virus by ferret passage.—*Amer. J. Hyg.* 41. 7-24. 584

G. describes his work from 1935 onwards on the modification of the distemper virus by passage through ferrets. [See also *V. B.* 16. 223.] At first he used two strains, one isolated from a fox on a fox ranch and the other the standard commercial dog virus. Later, when he had satisfied himself that all strains isolated from the fox ranch were immunologically identical with the standard dog virus, G. discarded the fox strain.

With serial passage in ferrets, the virus became more highly virulent for these animals but less virulent for foxes. The passages were

made with ferret spleen tissue injected subcutaneously into 2-4 ferrets for each generation. Virus of the 54th generation was sufficiently reduced in virulence to permit of its trial as a vaccine in an infected fox ranch. Some 8,000 foxes were injected, half of them with virus and serum, and the other half with virus alone. The outbreak was brought to a standstill without any significant mortality in foxes which had been inoculated with 2.5 mg. of the naked virus of the 54th passage. In 100 fox pups which were not inoculated, the mortality was 75%. Passages were carried on to the 63rd generation, but the 63rd generation virus did not offer any marked advantage over the 54th. It was also shown that the ferret passage virus was of very low virulence for dogs and could be used to immunize them against distemper. Experiments to modify the virus by skin passage are also described.—M. C.

ZIMMER, K. (1943.) Grössenbestimmung des Virus der Geflügelpest durch Ultrafiltration. [Determination of the size of the virus of fowl plague by ultrafiltration.]—*Arch. wiss. prakt. Tierheilk.* 78. 424-433. 585

A number of estimations of the size of viruses have been made by various methods on the virus of fowl plague and pseudo-fowl plague (Newcastle disease), to which Z. refers as Asiatic fowl plague. For fowl plague proper the virus size was estimated at 75-90 m μ and for Newcastle disease at 100 m μ . By ultrafiltration through gradocol membranes the classical fowl plague virus (Rostock strain) was estimated at 100-180 m μ and the Newcastle virus at 180 m μ (Milan strain) or 130-150 m μ (Braunfels strain).

Most of the paper is devoted to the technique of ultrafiltration and its application to mensuration. —J. E.

*HUPBAUER, A., & TOPOLNIK, E. (1944.) [Fowl plague established in Croatia.]—*Vet. Archiv.* 14. 1. [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 259.] 586

A fatal disease of fowls in Croatia was found to be due to the virus of fowl plague. The strain isolated was compared immunologically with classical fowl plague virus (Rostock strain) and atypical fowl plague virus (Braunfels strain). It proved to be identical with the latter type. It was assumed that the disease was introduced by military movements.—W. M. HENDERSON.

ALERAJ, Z. (1945.) Patološko-histološka slika središnjeg živčanog sustava kod kuge peradla. [Histopathology of the central nervous system in fowl plague.]—*Vet. Archiv.* 15. 58-66. [Abst. from German summary.] 587

The disease described was observed by A. towards the end of 1941 and judged by HUPBAUER

& TOPOLNIK [see abst. preceding] to be a typical fowl plague. To the time of writing, 297 carcasses had been examined by the Faculty of Veterinary Medicine, Zagreb, 20 of them (15 naturally and five artificially infected) forming the basis of this study.

The P.M. findings were generally typical, with acute catarrhal inflammation of the pharynx and haemorrhage and necrosis of the follicles of the glandular stomach. Occasionally there were haemorrhage and necrosis of the epithelium of the stomach muscles. There was acute catarrhal inflammation of the anterior part of the intestine with scattered punctiform haemorrhage in the surrounding mucosa, together with haemorrhage in the serous membrane and adipose tissue of the body cavity and oedema of the skin in the region of the neck and head.

Histological examination of the brain revealed a scattered perivascular endothelial reaction, with a picture of groups of endothelial, histiocyte and lymphoid cells and miliary necrosis, together with hyaline and vacuole ganglion cell degeneration as found by previous investigators. The pathological-histological changes found in the spinal cord sections, especially those from the lumbar region, were similar to those observed in the cerebrum and cerebellum and were ascribed to the virus of fowl plague. The picture of the groups of cells and the necrosis, which were found in the brain in most cases and which by the majority of workers are considered pathognomonic of fowl plague, were not seen in the spinal cords of any of these cases.

HECKE, F. (1944.) Diagnostisch bedeutsame Befunde bei Hühnerpest. [Diagnosis of fowl plague.]—*Z. InfektKr. Haustiere.* 60. 267–276. 588

In October, 1943, fowl plague broke out in Gotenhafen and the Danzig area, and caused very severe losses. In both naturally and experimentally infected fowls, in addition to the classical haemorrhages, certain fairly constant and hitherto undescribed lesions were found. They consisted of proliferative, haemorrhagic, and necrotic changes in the lymphoid structures of the small intestine, and ulcerative changes in the mucosa of the small intestine and caeca. These lesions, which recalled those seen in rinderpest and swine fever, were probably due to the action of the virus, and were most apparent in the more acute cases at the beginning of the outbreak.

Further studies would be required to show whether the strain of virus responsible for the "Gotenhafen type" lesions differed from the classical virus of fowl plague.—E. COTCHIN.

BEACH, J. R. (1945.) Avian pneumoencephalitis

vaccination experiments.—*Nulaid News.* February. Reprint pp. 3. 589

The vaccine used in these experiments was a formolized saline suspension of finely ground chick embryos which had died from inoculation with pneumo-encephalitis virus. Two doses of vaccine were given intraperitoneally with an interval of 5–7 days.

Vaccination of pullets 3–5 months old did not prevent infection at 4½–9 months of age, but although the disease was of a highly virulent type, mortality was relatively low in the vaccinated groups. The total mortality among the vaccinated birds of ten flocks affected at 6½–9 months old was 47%, as compared with 27·8% in the control of the same ten flocks. In addition, the effect of the disease on egg production was so much less in the vaccinated birds than in the controls that vaccination was considered worthwhile on these grounds alone. Chicks in one flock vaccinated when two weeks old were not appreciably protected against natural exposure to the disease two and a half months later.—J. D. BLAXLAND.

FURNESS, T. L. (1945.) Prophylactic vaccination against infectious laryngo-tracheitis.—*Aust. vet. J.* 21. 142–146. 590

The vaccine described was prepared from tracheal exudate of artificially infected birds diluted 1:40 to 1:100 with 50% glycerin in water and was applied to the cloacal mucous membrane by means of steel fencing wire with four nicks at the end. If less than 97% "takes" were evident after four days, all "non-takes" were revaccinated. Birds should be properly housed and healthy at the time of vaccination. Although vaccination of baby chicks has been successfully carried out, eight weeks was regarded as the minimum desirable age. A temporary leg paralysis lasting about 12 hours was seen in some flocks about the fourth day after vaccination.

Prophylactic vaccination had been carried out on a wide scale with highly satisfactory results.

—L. HART.

GORRIE, C. J. R. (1944.) Infectious laryngo-tracheitis vaccination in relation to the transmission of pullorum disease.—*Aust. vet. J.* 20. 343–344. 591

Vaccination for infectious laryngotracheitis was originally carried out in Victoria by the use of vaccines prepared from tracheal exudate from infected fowls. The vaccine was applied to the cloaca by means of a steel wool swab, many fowls being vaccinated with each swab. Egg-grown vaccine is now used, applied with an abrasive applicator [see abst. following].

Some circumstantial evidence is presented to indicate that pullorum disease can be spread by

the old method of vaccination. It was shown that *Salmonella pullorum* survived for at least three days in 50% glycerin (the suspending medium for laryngotracheitis vaccine) and that six fowls vaccinated on the cloaca with a suspension of *S. pullorum* in place of laryngotracheitis vaccine rapidly developed agglutinins to *S. pullorum*.

—L. HART.

GORRIE, C. J. R. (1946.) **New swab for infectious laryngotracheitis vaccination.**—*Aust. vet. j.* 22. 28. 592

G. describes a new type of abrasive applicator for use in applying laryngotracheitis vaccine to the cloacal mucous membrane. It consists of a wooden match splint $2\frac{3}{4}$ in. long, with a small slightly abrasive head of fine sand stuck on with glue. These make it possible to use a separate swab for each bird and eliminate the danger of spreading disease.—L. HART.

— (1945.) [Discussion on] **The vaccination of poultry against infectious laryngotracheitis.** [Speakers:—GORRIE, C. J. R., FURNESS, T. L., OXER, WEBSTER, A., & HART.]—*Aust. vet. j.* 21. 110–112. 593

GORRIE stated that laryngotracheitis is widespread in Victoria. Originally, vaccine was prepared from tracheal exudate from the outbreak, but now egg-grown vaccine is used and prophylactic vaccination is carried out by the farmer on birds 2–4 months old, using a fresh steel wool swab for each bird. FURNESS stressed the importance of correct diagnosis and the role of purchased pullets in spreading the disease. He applied vaccine to the cloacal mucous membrane near the outer edge with an applicator made of fencing wire with two nicks near the end: examination for “takes” was essential. OXER stressed the efficiency of vaccination with egg-grown virus and stated 97% “takes” or better should be obtained. WEBSTER considered that egg-grown virus could be used exclusively in the future once the practitioner could obtain the viable product. HART suggested the inoculation of filtrates into eggs and the use of immune serum as a means of obtaining a diagnosis in three days. The use of weak vaccines is dangerous. Fowl cholera and pullorum disease may be spread by tracheal exudate vaccines. He stressed the role of the “carrier” bird and advocated a zoning and depopulation plan to eradicate the disease from the Continent.

—L. HART.

HAMMON, W. MCD., REEVES, W. C., & GALINDO, P. (1945.) **Epidemiologic studies of encephalitis in the San Joaquin Valley of California, 1943, with the isolation of viruses from mosquitoes.**—*Amer. j. Hyg.* 42. 299–306. [Authors' summary copied *verbatim*.] 594

During the summer of 1943 in Kern Co., California, 203 patients with apparent virus infection of the central nervous system were hospitalized and studied in the County Hospital. There were 19 cases of Western equine and 5 cases of St. Louis encephalitis diagnosed by serological tests on acute and convalescent serum samples. One hundred and fifty other patients failed to develop paralysis, and many of these were probably also infected with an encephalitis virus.

From 10,152 blood-sucking arthropods including ticks and mosquitoes, 31 strains of Western equine encephalomyelitis virus and one new virus with neurotropic properties were isolated. Of the Western equine strains 28 were from *Culex tarsalis*, 1 from *Culex stigmatosoma* and 2 from *Aedes dorsalis* (first isolations ever made from the latter two species). Infection rates for all *C. tarsalis* were at least 1 per 78. In one area from which 104 mosquitoes were tested, 6 isolations were made from 6 pools tested, a rate of at least 1 per 18. Six hundred and twenty-two *C. tarsalis* caught during the winter yielded no virus, a finding which lends no support to the hypothesis of winter carry-over of virus in hibernating adults.

Twenty-six and 28 per cent. of the chickens which lived through just this one summer season had neutralizing antibodies to Western equine and St. Louis viruses, respectively. By precipitation tests made on the abdominal contents of engorged mosquitoes it was found that 55 per cent. of all *C. tarsalis* caught had fed on birds.

It is therefore concluded that these findings, very similar to those made in the Yakima Valley, Wash., indicate that *C. tarsalis* is the most important vector of Western equine type encephalitis in the San Joaquin Valley of California, and that birds (including domestic fowl) are an important source of virus infection for the mosquitoes.

HAMMON, W. MCD., & REEVES, W. C. (1945.) **Certain bacteriostatic agents added to sera used in diagnostic tests for neurotropic virus infections.**—*Proc. Soc. exp. Biol., N.Y.* 60. 84–88. 595

Various preservatives were tested, in the concentrations in which they would be used in serum, against dilutions of the chosen viruses (St. Louis encephalitis, Western and Eastern equine encephalomyelitis, poliomyelitis, Japanese B encephalitis). Zephiran (alkyl-dimethyl-benzyl-ammonium chloride) 1:10,000, merthiolate 1:10,000 and sodium sulphathiazole 1:500 were without effect on these viruses. Zephiran was not found to be suitable for *in vitro* tests on account of its effect on surface tension; a solution of sodium sulphathiazole, after standing, was found to be toxic for mice. Merthiolate was satisfactory, but its use

was discontinued in favour of mercuric cyanide 1:10,000 which was later replaced by phenyl mercuric borate 1:50,000. The last compound was used successfully in 1,000 sera in various *in vitro* and *in vivo* tests.—J. B. BROOKSBY.

DEENY, J., & MACCORMACK, J. D. (1946.) **The control of poliomyelitis.**—*Lancet*. 251. 8-9. 596

An attempt was made to control poliomyelitis in five separate outbreaks by treating houses and gardens, where infected patients were found, with a kerosene solution of D.D.T. Other preventive methods were also employed, such as careful disinfection of utensils, propaganda to avoid droplet infection, etc. The sudden arrest of the outbreaks is regarded as encouraging.—R. E. GLOVER.

I. BRADLEY, W. H. (1944.) **Epidemic hepatitis: a review.**—*Mon. Bull. Min. Hlth Emerg. publ. Hlth Lab. Serv.* 3. 46-55. 597

II. ANON. (1944.) **Epidemic hepatitis.**—*Med. Offr.* 71. 121. 598

III. BRADLEY, W. H. (1944.) **Epidemic hepatitis.** [Correspondence.]—*Ibid.* 151. 599

I. "Epidemic catarrhal jaundice", the name frequently applied to this condition, is a misnomer, as it presumes origin from a cholangitis, whereas the disease arises in the liver parenchyma and is a true hepatitis. As "infectious jaundice" is already used for Weil's disease, B. prefers "epidemic hepatitis".

The causal agent is probably a virus. Children and young adults are most susceptible and there is a seasonal incidence, with a winter maximum. Transmission appears to be by droplet infection and the typical incubation period is 30 days. The pathology is an acute hepatitis and there is no catarrh of the bile ducts or duodenum. Other types of hepatitis in which the lesion is essentially similar are (1) that associated with epidemics of enteritis due to salmonella, (2) the blood-borne disease seen following transfusion, with an incubation period of about 100 days, (3) hepatitis associated with upper respiratory infections and having a short incubation period and (4) that associated with glandular fever, with an incubation period of 15-30 days.

The clinical history of epidemic hepatitis begins with general malaise, lasting 2-10 days. This is followed by mild or severe jaundice. Of the complications, general inflammatory processes and sub-acute yellow atrophy of the liver are the most serious. Ascites and cirrhosis may occur as remote sequelae. The differential diagnosis must take into account obstructive jaundice, Weil's disease and the various toxic agents causing hepatitis. The prognosis is good. One death in 500 cases is a rough estimate of the mortality. In a fatal case there is "cholaemia", with delirium,

convulsions and rapid pulse, sinking to coma. Treatment consists in confining the patient to bed, on a low fat but high protein and sugar diet. No drug is found to be of especial value.

II. In editorial criticism of the above article, the writer suggests that there is no evidence, except from a small number of P.M. examinations, to suggest that the various types of hepatitis considered in I to show the same hepatic injury are in fact the same. A parallel is drawn between glandular fever and epidemic hepatitis.

III. B. replies to the criticism, stating that the conclusions with regard to the hepatic injury were based on the Van den Bergh reaction and on liver biopsy. Epidemic hepatitis is an entity distinct from glandular fever.

[The causes of acute hepatitis and liver atrophy in man are of veterinary interest for their possible bearing on the problems of liver atrophy in horses following inoculation with horse serum, and of "blue nose" disease of horses—see V. B. 9. 870-871 and 17. 85.]—J. B. BROOKSBY.

UTTER, M. F., REINER, J. M., & WOOD, H. G. (1945.) **Measurement of anaerobic glycolysis in brain as related to poliomyelitis.**—*J. exp. Med.* 82. 217-226. 600

The anaerobic glycolysis of mouse brain homogenates can be increased ten-fold by the addition of coenzymes and phosphate esters. Previous reports that alterations in anaerobic glycolysis in brain preparations from mice with poliomyelitis are considered to be of doubtful value as the measurements were not made under optimal conditions.—A. T. PHILLIPSON.

SASLAW, S., WILSON, H. E., DOAN, C. A., WOOLPERT, O. C., & SCHWAB, J. L. (1946.) **Reactions of monkeys to experimentally induced influenza virus A infection. An analysis of the relative roles of humoral and cellular immunity under conditions of optimal or deficient nutrition.**—*J. exp. Med.* 84. 113-125. [Authors' conclusions copied *verbatim*.] 601

Macaca mulatta monkeys on a normal diet have proved resistant to intranasal but not to intratracheal inoculation of influenza virus. Neutralizing antibodies appeared 8 to 10 days after inoculation with either living or heat-inactivated virus. The antibodies were noted to be still present as long as 9 months after infection with living virus. A specific granulopenic leucopenia characteristically followed primary influenza virus inoculation, regardless of altered conditions of diet, exposure, and route of inoculation, but it was not observed in monkeys previously infected with the same virus, all of which invariably survived. Nutritional deficiency and exposure to cold increased the susceptibility of monkeys on

intranasal instillation of the virus; the leucopenia was profound and fatalities frequently occurred even though neutralizing humoral antibodies developed as promptly and in relatively the same titer as under optimum nutritional conditions.

HOWE, H. A., & BODIAN, D. (1945.) **The question of the transmission of poliomyelitis to rhesus monkeys by accidental laboratory infection.**—*Amer. J. Hyg.* **42**, 266–273. [Authors' summary copied *verbatim*.] 602

Three viruses showing all the characteristics of poliomyelitis were isolated from 3 uninoculated rhesus monkeys by Craigie and Fisher. Two of these animals were asymptomatic. This suggested that the animals in question had been infected by some more or less natural mode of contagion although it was impossible to completely exclude the possibility that they had been used for previous experiments in other laboratories.

The biological properties of these viruses have been studied by the Baltimore group. While they all produce paralysis and lesions characteristic of poliomyelitis in the rhesus monkey, they apparently evoke no reaction by the alimentary route and are not demonstrable in the central nervous system or stools by ordinary methods. It seems unlikely, therefore, that they would pass readily from one animal to another in the laboratory.

WARREN, J., & SMADEL, J. E. (1946.) **Further observations on the virus of encephalomyocarditis.**—*J. Bact.* **51**, 615–616. [Only abst. given: copied *verbatim*.] 603

Helwig and Schmidt, of the U.S. Army, recently recovered a transmissible filterable agent from a chimpanzee which induced a disease in mice characterized by paralysis and myocarditis. This agent was sent to the Army Medical School for further study.

The agent becomes highly neurotropic when maintained by serial intracerebral passage in mice. Encephalitis develops rapidly and mice die within 24 hours. Titration end points of 10^{-8} to 10^{-9} are obtained when infected brain is injected intraperitoneally or intracerebrally into young or old mice. No macroscopic evidence of myocarditis occurs in mice dying rapidly, but an extensive acute focal necrotizing myocarditis, visible grossly, occurs when death is delayed. Histological changes in the brain are characterized by widespread necrosis of nerve cells when death occurs early and extensive cellular infiltrations after a protracted disease. Necrosis of Purkinje cells of the cerebellum is striking.

Hamsters developed encephalitis and myocarditis after inoculation of virus. Guinea pigs, rabbits, and a rhesus monkey showed only febrile reactions following intracerebral injection. Each

of these species developed specific neutralizing antibodies during convalescence. Few mice survive infection but these subsequently resist reinfection.

Attempts to demonstrate immunological relationships between the virus of encephalomyocarditis and other filterable agents have been unsuccessful. The following viruses or antisera were employed: St. Louis, Japanese, West Nile, Semliki Forest, Russian spring-summer, and Louping Ill encephalitis; Eastern, Western, and Venezuelan encephalomyelitis; herpes; lymphocytic choriomeningitis; Theiler's (GD VII); poliomyelitis (Lansing); and influenza "A" and "B". The small size of the Florida agent eliminated the elementary body viruses from consideration.

ANIGSTEIN, L., & BADER, M. N. (1948.) **Investigations on rickettsial diseases in Texas. Part 1. Epidemiological role of ticks common to the Gulf Coast in relation to local spotted fever. Part 2. Experimental and epidemiological studies on an outbreak of spotted fever in the Gulf Coast.**—*Texas Rep. Biol. Med.* **1**, 105–116 & 117–140. 604

1. In a survey of a Gulf Coast area where cases of spotted fever had been recognized, reactions to the Weil-Felix test were positive in 29 out of 98 dogs, in 19 out of 85 cattle and in 22 out of 124 swine. A positive reaction was associated among the dogs with *Rhipicephalus sanguineus* infestation and among the cattle with *Amblyomma americanum* and *A. maculatum*. The inoculation of material from the trituration of batches of *R. sanguineus* into g. pigs and rabbits produced in some cases the lesions of experimental spotted fever, and rickettsia-like organisms were demonstrated in the lungs. Similar experiments with *A. americanum* resulted in a severe disease with a high death rate in the inoculated g. pigs. The evidence suggests that the ticks mentioned can be incriminated as carriers of spotted fever, although the canine and bovine hosts are not affected.

2. Four cases of spotted fever occurred among children in a "trailer camp" in the Gulf Coast area. A tick survey of the area was made, and all of 5,500 ticks identified were *A. americanum*. Inoculation of triturated material of ticks from dogs and a cow, taken at the scene of the outbreak, produced a febrile reaction in a g. pig. Material from patients dead of the disease was passaged in g. pigs and the lesions were similar to those produced by a strain of spotted fever rickettsia isolated in Idaho. Rickettsia were demonstrated, especially in mononuclear cells from perivascular inflammatory foci in the skin of the human patients.

Cross-immunity tests in g. pigs established the identity of the strains from the two patients examined. These strains were also identical with the Idaho strain, although the latter had been spread by the tick *Dermacentor andersoni*. Cross-immunity tests with louse-borne typhus of Spanish origin and murine typhus of Texas failed to demonstrate any relationship. The authors suggest that the classification of spotted fever strains should be based, not on their virulence for the g. pig, but on the genus of tick concerned in their spread.—J. B. BROOKSBY.

VAN DEN ENDE, M., LOCKET, S., HARGREAVES, W. H., NIVEN, J., & LENNHOF, L. (1946.) **Accidental laboratory infection with tsutsugamushi rickettsia.** — *Lancet*. 251. 4-7. [Authors' summary copied *verbatim*.] 605

Four cases of accidental laboratory infection with scrub-typhus are reported. Their occurrence in relation to precautionary measures taken in the laboratory is discussed.

From two cases the causal rickettsia was isolated in mice and guinea pigs by intraperitoneal inoculation. In one of them isolation succeeded

See also absts. 534 (gastro-enteritis in pigs), 543, 667 (bacteriophage), 611 (poliomyelitis).

IMMUNITY

ZWIJNENBERG, H. A. (1945.) Het allergisch effect en zijne mogelijkheid als pathogenetisch moment in enkele dierziekten, eene vergelijkend-medische studie. [Allergy in causation of certain disease syndromes in animals. A clinical and pathological study.]—*Tijdschr. Diergeneesk.* 70. 124-160 & 171-201. [Abst. from English summary.] 607

Z. considers that a number of syndromes such as grass-sickness in horses, grass tetany in cows, *longjacht* in cows and conditions characterized by local oedema are manifestations of allergy. He draws attention to certain resemblances in the pathology, occurrence and clinical symptoms of these conditions.

The outstanding feature of allergenic conditions is infiltration of serous fluid into the tissues. Such infiltration is considered to be diphasic in character involving both exudation and transudation. The allergic syndrome is considered to involve three stages, a combination of an "allergen" with antibody, the formation of a stimulus and the reaction of the tissues to the stimulus. Sensitivity may in many cases be hereditary. Histamine or histamine-like substances developed following destruction of body proteins may provide the stimulus.

It is claimed that there is no evidence of an exogenous toxic substance being concerned in the aetiology of grass sickness, grass tetany, etc. The

also in mice which received ground blood-clot intranasally.

The diagnosis could be established by *Proteus* OXK agglutination tests and complement fixation with formalised scrub-typhus antigen.

All the patients had previously received immunising injections of scrub-typhus vaccine prepared from cotton-rats. Their complete recovery suggests that the vaccine had some protective value.

TOPPING, N. H., & SHEPARD, C. C. (1946.) **The preparation of antigens from yolk sacs infected with rickettsiae.**—*Publ. Hlth Rep., Wash.* 61. 701-707. [Authors' summary copied *verbatim*.] 606

Three methods for the preparation of antigen from yolk sacs of hen's eggs infected with rickettsiae have been developed. All three methods utilize some of the properties of diethyl ether in the purification of the antigen. No single method is satisfactory for all the five species of rickettsiae studied. The results of antigen titrations against homologous antisera are presented and discussed.

evidence suggests a substance endogenous in origin arising as a result of intestinal intoxication.

Longjacht is described as a disease common in Holland characterized by suddenly developed emphysema of the lungs and associated with the grazing of cattle on aftermath, it has some resemblance to the condition called "fog fever" in England. The writer considers it is analogous with certain forms of asthma in man, and possibly due to inhalation of mould spores from dry soil in the autumn.

The need for co-operation between biochemists and clinicians in the study of these conditions is stressed.

CHASE, J. H., WHITE, A., & DOUGHERTY, T. F. (1946.) **The enhancement of circulating antibody concentration by adrenal cortical hormones.**—*J. Immunol.* 52. 101-112. 608

The work described, which was initiated as the result of findings relating to the release of γ -globulin from lymphocytes by pituitary-adrenal cortical extracts, represents an amplification of preliminary investigations of the effect of adrenal cortical extracts on serum antibody levels. The materials and methods used were as follows: animals—mice and white rabbits of both sexes and male rats; antigens—sheep red blood corpuscles, lyophilized horse serum in 10% solution, staphylococcal toxin, egg albumin in 5%

solution, and pregnant mare's serum (gonadin); hormone preparations—aqueous cortical extract (Wilson) and cortical steroids in oil (Upjohn); antibody titrations—agglutination, precipitin, and, in appropriate instances, haemolysin tests.

Results obtained indicated (1) that mice, rats, and rabbits which received subcutaneous injections of aqueous cortical extract (0.2 ml. three times weekly for eight weeks) at the times of antigen administration had more rapid increases in antibody titre and much higher final titres than animals receiving antigen alone, (2) that hyper-immunized rabbits which received a single subcutaneous injection of adrenal cortical extract (5–10 ml.) had a rise in antibody titre to approximately twice the pre-hormone-injection level within 6–12 hours (this titre dropped to pre-injection level in 24 hours) and (3) that continued daily injection of cortical steroids in oil over a period of 16 days (5 ml. the first day and 1 ml. each day thereafter) maintained antibody titre at a level higher than that ever attained in animals receiving antigen alone.

It is suggested that the enhancement of the blood titre is due to the increased rate of antibody release from lymphocytes effected by adrenal cortical steroids of the C-11 oxygenated type and that during immunization each injection of antigen induces an anamnestic response mediated through pituitary-adrenal cortical stimulation with resultant antibody release due to "lymphocyte dissolution".

[The significance of this work in relation to many immunological problems and the possibility that it may explain some aspects of the peculiar changes in blood antibody levels which occur at parturition (with its pituitary-adrenal cortical activity) indicate that these findings may be of considerable importance.]—J. L. MCGIRR.

IGLESIAS, R., & LIPSCHUTZ, A. (1946.) **Relations of steroid hormones and anhydro-hydroxyprogesterone to fibromatosis.**—*Lancet*. 251. 488–490. [Authors' summary copied *verbatim*.] 609

The antifibromatogenic action of steroids and their antitumoral action in general is discussed.

Anhydro-hydroxyprogesterone (A.H.P.), a synthetic steroid active by mouth, was tested for its power to prevent oestrogen-induced fibroids in the guineapig.

A.H.P., whose progestational activity is about a tenth of that of progesterone, has been shown to be also antifibromatogenic. But the quantities of A.H.P. necessary to prevent abdominal fibroids are about fifteen times greater than the antifibromatogenic dose of progesterone, though the antifibromatogenic effect is evident with smaller quantities of A.H.P.

Uterine fibroids are more readily prevented than other abdominal fibroids.

Oestrogen-induced uterine bleeding was counteracted with quantities of A.H.P. much smaller than those necessary for obtaining an antifibromatogenic effect.

The prospects of clinical trials with A.H.P. are discussed.

MAUNSELL, K. (1946.) **Direct test for blocking antibody in treated hay-fever.**—*Lancet*. 251. 199–201. 610

Two groups of hay fever patients were selected and in one (11 cases) specific desensitization was carried out, while in the other (13 cases) non-specific desensitization with human iso-serum from non-allergic cases was used. By appropriate skin tests with mixtures of antigen (pollacrine) and the patient's own serum, it was demonstrated that a "blocking substance" developed only in the first group, since in this group there was failure to develop weals at the site of inoculation of the mixture.—J. B. B.

MORGAN, I. M. (1946.) **Allergic encephalomyelitis in monkeys in response to infection of normal monkey cord.**—*J. Bact.* 51. 614–615. [Only abst. given: copied *verbatim*.] 611

By the use of Freund's adjuvant technique in monkeys an allergic reaction has been induced to normal monkey spinal cord injected subcutaneously with falba, paraffin oil, and heat-killed tubercle bacilli. This results in a characteristic clinical reaction of ataxia, spasticity, and disorientation often associated with blindness appearing from two to seven weeks following injection. Seven of twelve monkeys thus inoculated have shown such a reaction, as well as eight of nine monkeys injected with adjuvants plus poliomyelitis-infected cord. None of eight control monkeys injected with adjuvants plus saline has shown any abnormal sign or pathological change in the central nervous system; nor any of another series of eight injected with adjuvants plus other organs. The pathological reaction consists of intense foci of perivascular and extravascular infiltration irregularly disseminated throughout the brain and spinal cord, showing a mixture of lymphocytes and polymorphonuclear leucocytes including a varying proportion of eosinophils. There is often focal necrosis and hemorrhage.

RAMON, G., JOANNON, P., RICHOU, R., & CORRE, L. (1941.) **Une nouvelle substance adjuvante et stimulante de l'immunité: le tannin. [The action of tannic acid in stimulating the production of antibodies.]**—*C. R. Soc. Biol. Paris*. 135. 45–48. 612

When tannin was added to diphtheria or

tetanus anatoxin and injected into rabbits and g. pigs antibody production increased. The best

results were obtained when a dilution of 0.6% tannin was used.—S. J. GILBERT.

See also absts. 515-531 (BCG vaccine), 520, 531, 532 (vole bacillus vaccine), 515, 527-530 (tuberculin), 533 (complement fixation in Johne's disease), 537 (porcine pasteurellosis vaccine), 546 (salmonella antigens), 551, 552, 555 (brucella vaccine), 569 (leptospira agglutinins), 572 (rabies, natural immunity), 573 (rabies vaccine), 576, 577 (equine encephalomyelitis), 578 (rinderpest), 581 (ovine influenza), 584 (dog distemper), 589 (avian pneumo-encephalitis), 590-593 (laryngostracheitis), 601 (influenza), 606 (ricketsia antigens), 635 (rabbit fibroma).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

PAVLOVSKIĬ, E. N. (1941.) Zashchita ot gnusa (komarov, moshek, moskitov, slepnei idr.) [Protection from blood-sucking Diptera (mosquitoes, midges, sandflies, tabanids, etc.).] pp. 67. Moscow & Leningrad: Academy of Science. 90 kop. [Part of review in *Rev. appl. Ent. Ser. B.* 33, 15, copied *verbatim*.] 613

This booklet, which is intended for Army use, contains brief notes on the habits of blood-sucking Diptera and on the diseases they transmit to man and animals, followed by a survey of methods of protecting man and horses from them, based on the literature and on experiments in various parts of the Russian Union.

Effective protection against mosquitoes and other insects has been obtained by the use of mittens and a headpiece made of coarse net impregnated with a repellent. The net is impregnated by steeping it for several hours or boiling it for 3-4 hours in a repellent mixture. Of several mixtures given, the best were 15 parts lysol, 8 parts turpentine and 77 parts water, and a 10 per cent. emulsion of birch tar, the latter being of particular value against *Phlebotomus*. A net remains effective for 10-12 days, without retreatment, but should be kept folded and wrapped when not in use.

Impregnated netting also proved very effective as a bed-curtain against mosquitoes, or to screen the entrance and bottom edges of tents, and horses can be protected from flies by hanging treated ropes or weighted strips of fabric to screen the entrances of stables and by attaching treated material to harness.

STEINHAUS, E. A. (1945.) Insect pathology and biological control.—*J. econ. Ent.* 38. 591-596. 614

Although there are considerable possibilities in the biological control of insects by pathogenic micro-organisms, this field is to-day largely neglected. Knowledge of the effects of bacterial, fungal, protozoan and virus diseases on natural insect populations is scanty, although these organisms are frequently observed to cause mortality in insects of economic importance.

Following d'Herelle's successful use of *Coccibacillus acridiorum* in the control of the locust *Schistocerca gallea* in Mexico, few successes and many failures have been recorded in the use of micro-organisms in insect control. This may be

due to the entomologists' lack of application of bacteriological principles and also to the need for research into the relations between insects and the numerous micro-organisms that attack them. Among bacteria, a search should be made for species which are characteristically pathogenic for insects in nature. Among the protozoa, the potentialities of the use of members of the microsporidia appear considerable, since a few members of this group cause devastation among many useful insects. If effective, the use of micro-organisms in insect control would prove relatively cheap and more than one organism might be used against an insect pest, at one or several stages in its life-history.—L. DAVIES.

BOUVIER, G. (1944.) Note sur quelques oeufs d'ectoparasites se rencontrant sur les animaux domestiques (Anoplura et Mallophaga). [Note on some ectoparasite ova found on domestic animals (Anoplura and Mallophaga).]—*Schweiz. Arch. Tierheilk.* 86. 378-385. [In French.] 615

Brief morphological descriptions and figures are given of the eggs of the following species of lice, mounted in a medium consisting of chloral hydrate with glycerin and gum arabic:—*Haemadipsus ventricosus*, *Gliricola porcelli*, *Gyropus ovalis*, *Trimenopon jenningsi*, *Haematopinus eurytarnus*, *H. asini*, *Bovicola bovis*, *B. caprae*, *B. pilosa*, *Felicola subrostrata*, *Linognathus setosus*, *L. vituli* and *Polyplax spinulosa*.—M. L. BINGHAM.

VANDERPLANK, F. L. (1944.) Apparent densities of certain African blood-sucking insects (Diptera).—*Proc. R. ent. Soc. Lond. Ser. A.* 19. 68-72. 616

Records are published of the numbers of biting flies caught on a tethered ox near Old Shinyanga, Tanganyika, from November, 1940, to August, 1941. *Tabanus taeniola* was most dense during December, disappearing in July after the dry season had started; it was more likely to be caught during the middle hours of the day. *Pangonius*, *Nuceria* and *Dorcalaemus* were caught only during April and May, very large numbers of *P. zonatus* being caught during April; the maximal activity appeared to occur toward mid-day and on through the afternoon. *Haematopota* were caught only during the rains, and were inactive at mid-day except when the sun was obscured by cloud. *Glossina swynnertoni* increased in numbers

during the rains and decreased during the dry season; *G. pallidipes* decreased considerably from November to December and then gradually rose in density.

It is pointed out that the percentage of game with trypanosome infection reaches a peak during March and April and it is suggested that this may be due in part to the high density of blood-sucking flies other than *Glossina*, notably *Pan-gonius*.—U. F. RICHARDSON.

RENN, C. E. (1941.) The food economy of *Anopheles quadrimaculatus* and *A. cruciana* larvae. Relationships of the air-water interface and the surface-feeding mechanism.—*Symposium on Hydrobiology*. pp. 329–342. Madison: University of Wisconsin Press. [Abst. in *Rev. appl. Ent.* 33. 69, copied *verbatim*.] 617

Details are given of observations in the United States on larvae of *Anopheles quadrimaculatus*, Say, and *A. crucians*, Wied., which showed that they feed by two distinct methods. The classical or eddy mechanism of feeding in the subsurface layer was less usual in natural breeding places than a method, here called interfacial, in which the floating particles approach the mouth jerkily along straight lines from all directions with approximately equal velocity, carried along by the air-water interfacial film, which itself undergoes contraction and flow caused by the feeding movements of the larva. Under experimental conditions, the type of feeding was determined by the physical properties of the medium, eddy feeding replacing interfacial feeding as surface tension decreased. It is suggested that these findings may have a bearing on research on larvicides.

WILSON, S. G. (1946.) Seasonal occurrence of Ixodidae on cattle in Northern Province, Nyasaland.—*Parasitology*. 37. 118–125. 618

As East Coast fever and its vector tick remain common in the Northern Province of Nyasaland after 14 years of cattle dipping, it is suggested that a study of the climatic requirements of ticks in this area might allow an improvement in the dipping control measures.

Adults of *Amblyomma variegatum* occur on domestic animals from November to March, i.e., during the warm wet season. Larvae and nymphs have a wide range of hosts and occur throughout the dry cold season, April to October, the nymphs being present also in small numbers during the rains.

Rhipicephalus appendiculatus is predominantly a cattle tick, attaching to the ears, but the larvae have other hosts. Females seem able to engorge and oviposit only during the hot wet months, December to March. Larvae and nymphs first appear in April, larvae occurring until July, and

nymphs until November. Larvae hatched in the laboratory survived unfed for only about a week.

The adults of *Palpoboophilus decoloratus* [*Boophilus decoloratus*] and *Uroboophilus fallax* [*B. annulatus microplus*] show no seasonal periodicity. Nymphs and adults occur together and attach to the udder and abdomen of cattle. Larvae were only once found associated with adults and were then attached to the ears of calves.

Adults of *Rhipicephalus capensis* appear suddenly on cattle during the last week of August and feed on the udder and flanks. They tend to disappear in November. Larvae and nymphs were not found. Adults of *R. tricuspis* occur on cattle from November to February, being confined to the tail switch. *R. simus* is not found on cattle during the colder months of the year and it is doubtful if females fully engorge on cattle. *R. simus* was found on game in large numbers only in January and May, thus showing a seasonal differentiation from *R. tricuspis*, with which some authorities consider it identical.

Adults only of *Hyalomma impressum transiens* are found on cattle, attaching to the tail switch and sometimes the udder. They occur throughout the dry season, with the highest incidence from March to May.

Small numbers of *Ixodes pilosus* occur in the ears of cattle from December to March.

It is concluded that except for *Boophilus*, ticks have only one breeding cycle per year under conditions in the Nyasaland plateau and that though adults of *R. appendiculatus* occur throughout the year, the important breeding season is during the hot wet period; by moving cattle during this period the larvae might be left to starve.—U. F. RICHARDSON.

I. MILNE, A. (1945.) The ecology of the sheep tick, *Ixodes ricinus* L. The seasonal activity in Britain with particular reference to Northern England.—*Parasitology*. 36. 142–152. 619

II. MILNE, A. (1945.) The ecology of the sheep tick, *Ixodes ricinus* L. Host availability and seasonal activity.—*Ibid.* 36. 153–157. 620

III. MILNE, A. (1946.) The ecology of the sheep tick, *Ixodes ricinus* L. Distribution of the tick on hill pasture.—*Ibid.* 37. 75–81. 621

I. Observations are recorded on the seasonal activity of *I. ricinus* on farms in Cumberland (Cragg, relatively moist and warm) and Northumberland (Hethpool, relatively dry and cold) and an attempt is made to assess how far tick activity is correlated with temperature and humidity. At Cragg the peak of the spring activity occurred in May and there was a secondary period of activity in September. More than half the annual activity occurred above the 60°F. level of shade temperature, although this has been claimed as the upper

limit of activity. At Hethpool, the spring peak of activity occurred in early April, but there was no autumn activity, although the average maximum temperatures pass down through the 60°-45°F. range during the autumn. These observations, taken in conjunction with similar ones made by other investigators, indicate that temperature is not the only external factor controlling activity of female ticks. Solar radiation, evaporativity (weekly totals of [pasture ?] evaporation in ml.) and humidity were also investigated in relation to female activity and it is tentatively suggested that the duration of maintenance of high relative humidity during daylight, in conjunction with temperature, may decide the extent of activity in summer. In spring, males and females appeared in small numbers a few weeks before the nymphs, but the bulk of nymphal and adult activity occurred concurrently. Larvae appeared later than adults, the peak being about a month later.

II. From the theory that *I. ricinus* produces two broods per year it has been suggested that the cessation of tick activity in summer is due to the spring crop of ticks having all engorged in the spring. However, the withholding of sheep from pastures for periods up to three weeks after the normal peak of tick activity did not result in a prolongation of the activity period. Delay in stocking resulted in an early slightly higher sheep infestation than normal, but this was rapidly reduced.

From this it is concluded that a varying proportion of the tick population becomes active each week during the tick period and that the average duration of individual activity is probably not more than a month. Under delayed stocking, only about half the ticks available in the grazing appeared to be fed and the ticks which missed feeding were thought to be those which became active before stocking. It is concluded that the "two brood" theory is untenable in so far as it claims that activity ends in spring because all available ticks are fed.

III. Tick density on sheep pastures was investigated by the blanket-dragging method, using the nymph count as criterion. Simultaneous drags were found necessary to estimate the relative density of active nymphs on plots, this density being assumed to be proportional to the ground-population density. The time and space factors as they affect sampling methods are discussed. Sheep lairs [night resting places] were found to have a significantly lower nymphal density than the general pastures, whilst the density on sheep paths and their borders was similar to that on the general pasture. On hills the nymphal density decreased with altitude, this being ascribed to conditions of vegetation. As

agricultural improvement of pastures is believed to reduce tick population, it is suggested that such measures should be directed to the lower slopes of hills and to valleys, where the tick density is greatest. In five out of nine cases, pairs of adjacent plots within apparently uniform stretches of hill pasture had significantly different tick populations. With this in mind, workers carrying out non-replicated experiments should first make population estimates of proposed experimental and control plots.—U. F. RICHARDSON.

LEES, A. D. (1946.) Chloride regulation and the function of the coxal glands in ticks.—*Parasitology*. 37. 172-184. 622

From investigations concerning the structure and functions of the coxal glands of *Ornithodoros moubata* and the chloride regulation of *O. moubata* and *Ixodes ricinus*, it is concluded that Malpighian tubes play no part in chloride excretion in *O. moubata* and little part in *I. ricinus*. In *O. moubata*, excess water and salts are excreted in the coxal fluid. In *I. ricinus* there are no coxal glands, but the tick requires a long period to feed and during that period is exposed to the high temperature of the host's skin, so that evaporation of water from the cuticle may be considerable; in addition a high proportion of water may be excreted by the Malpighian tubes. *I. ricinus* possesses considerable tolerance to haemolymph concentration and the chloride content may rise to 1.3% without signs of injury.—U. F. RICHARDSON.

CASSAMAGNAGHI, A., hijo. (1945.) La sarna demodectica de los bovinos. Su reconocimiento en el Uruguay. [Demodectic mange in cattle in Uruguay.]—*Bol. mens. Direcc. Ganad., Montevideo*. 28. 8-18. 623

C. gives a general description of demodectic mange in cattle, including a description of the organism, lesions caused, diagnosis and prophylaxis, and a discussion on the epidemiology and economic importance of the disease.—I. W. J.

TOOP, C. R. (1945.) Sarcoptic mange of pigs.—*J. Dep. Agric. W. Aust.* 22. 65-70. 624

This article, written for the farmer, deals with the cause, mode of transmission, symptoms, diagnosis and treatment of the disease. For treatment, dipping the pigs in crude oil is recommended; application by spraying is slower and wastes oil. Warm lime-sulphur dipping is also recommended.—H. McL. GORDON.

NÖRR, J. (1944.) Über Sarkoptesräude beim Lama sowie ihre Übertragung auf andere Tierarten und auf den Menschen. [Sarcoptic mange in the llama its transmission to other animal species and to human beings.]—*Arch. wiss. prakt. Tierheilk.* 79. 121-133. 625

A remarkable clinical feature of sarcoptic

mange in llamas is the thickness of the scab, up to 19 mm. covering the infested areas. Five llamas were observed, two being kept as untreated controls, two treated with "aulin" (active principle, bisethylxanthogene), and one with "odylen." Especial care was taken in treating the natural orifices and adjoining regions where mange remained concealed for some time. The two treated animals recovered and the controls died. Offspring of an infected animal were kept free from disease by the use of "odylen".

Llama mange was artificially transmitted to a horse, a calf, a goat, a sheep and a pig. Infection was most serious in the goat and pig. Llama mange can occasionally be transmitted to man, but such infections rarely require clinical treatment.—BERYL THURSTON.

CARTER, H. F., & D'ABRERA, V. ST. E. (1946.) **Mites (Acarina)—a probable factor in the aetiology of spasmodic bronchitis and asthma associated with high eosinophilia.**—*Trans. R. Soc. trop. Med. Hyg.* **39**. 373–395. 626

Twenty-five Ceylonese with respiratory disorders associated with high eosinophilia (3,000–42,550 per cu.mm.) were examined for the

presence of mites in the sputum. Twenty-four-hour samples were taken in rubber-stoppered bottles, containing 1% potassium hydroxide, set in containers of pyrethrum extract and anointed with vaseline to prevent contamination by mites. The sample was macerated in more caustic when necessary, centrifuged and the deposit examined microscopically. Mites were present in all cases, usually in small numbers. Tarsonemidae and Tyroglyphidae were the predominant families present, but a few Parasitidae and Cheyletidae were seen. Mites were present in the urine of three patients. The authors believe that live mites were established in the lungs, at least in some cases. The mites' role as allergens in asthma and as sources of foreign protein in the production of eosinophilia is discussed.

Organic arsenicals (stovarsol, carbarsone or novarsenobillon), given orally, cured all but one case, with abatement of respiratory symptoms and resolution of eosinophilia.

Case histories, together with differential white cell counts, eosinophile counts and results of sputum examination for mites before, during and after treatment are presented in tabular form.

—T. SPENCE.

See also absts. 513 (screw-worm fly), 568 (ticks and East Coast fever), 579 (sheep ked), 594 (mosquitoes), 604 (ticks and rickettsial diseases), 691–698 (parasiticides), 738 (mosquito control).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

IVANITSKIĬ, S. V., TSYMBAL, T. G., & NOSIK, A. F. (1940.) Sluchaĭ obnaruzheniya Dipylidium caninum L. 1758 g. u svin'i. [Discovery of *Dipylidium caninum* in the small intestine of a pig.]—*Sborn. Trud. Kharkov. vet. Inst.* **19**. No. 1. 163–164. [Abst. from French summary.] 627

The authors found a portion of a mature strobila of *D. caninum* in the posterior portion of the small intestine of a pig. The section of tapeworm was 113.5 mm. long and comprised 18 complete proglottides and one which was cut. The proglottides measured 7.0–9.84 mm. long by 2.0–2.64 mm. wide; they were motile. There is no illustration.

*SCHNEIDER, K. (1942.) Ueber den Einfluss von Alter und Umwelt auf den Parasitenbefall einer Schafherde im Taunus. [Ecology of parasitic infestation of sheep in the Taunus].—*Inaug. Diss., Hanover*. [Abst. from abst. in *Dtsch. tierärztl. Wschr. / Tierärztl. Rdsch.* **51** / 49. 216.] 628

From faecal examination, coccidia, *Moniezia*, *Nematodirus* and *Trichuris* were recorded in lambs. Coccidia, *Nematodirus* and *Trichuris* infested the sheep-pens, but *Moniezia* only contaminated pastures. The high incidence of *Moniezia* was

attributed to the occurrence of numbers of the mites which serve as intermediate hosts. [The German abstract gives no indication of the parts played by climate, soil and pasture in endoparasitism.]—BERYL THURSTON.

HABERMANN, R. T. (1946.) **The probable origin of some unusually heavy infections with the common sheep hookworm (*Bunostomum trigonocephalum*).**—*Proc. helminth. Soc. Wash.* **13**. 11–12. 629

H. reports a very heavy infestation with *B. trigonocephalum* in sheep at the Federal Research Centre, Beltsville, Maryland.

In 89 sheep examined, of which 55 had been reared at the research station, there was an average infestation of 86 hookworms, including three individual counts of 280, 555, and 634 hookworms. The remaining 34 sheep, which had been recently introduced to the research station, had an average infestation of 50 hookworms.

H. emphasizes that the average infestation by *B. trigonocephalum* is usually under 20 worms, and individual counts exceeding 100 are exceptional.

He concludes that this abnormal infestation is attributable to the fact that the sheep were kept crowded in pens, bedded down with straw and fed hay, the litter which accumulated providing

ideal conditions for the cutaneous penetration or ingestion of the infective larvae.—D. W. JOLLY.

BARKER, C. A. V. (1946.) **Method for the recovery of Nematodirus adults, eggs and larvae for experimental purposes.**—*Canad. J. comp. Med.* 10. 117-119. 630

B. describes a method for recovering large numbers of *Nematodirus*. The first 20 ft. of the small intestines of heavily infested lambs were opened in water, washed free of debris and sedimented; the mass of *Nematodirus* was examined for other large species and then macerated. The eggs were separated by screening through bolting silk, and were allowed to develop in water 3-5 mm. deep at 24°-30°C.—W. E. SWALES.

MAROTEL, GRATECOS, & BODET. (1942.) Une nouvelle maladie parasitaire: la dictyocaulose cardiaque. [**Cardiac Dictyocaulus infestation: a new parasitic disease.**]—*Rev. Méd. vét. Lyon et Toulouse*. 93. 100-102. 631

The discovery of a number of adult worms in the heart of a heifer is described. The worms resembled *Dictyocaulus viviparus* as indicated by examination of the male caudal appendages.

The authors review the life-histories of *D. viviparus* and of *Haemostrongylus vasorum* which parasitizes the heart of the dog. The modifications which would be necessary in the life-history of *D. viviparus* to allow its successful occupation and propagation in the heart, as opposed to its normal habitat in the respiratory system, are dis-

See also absts. 579 (*Muellerius capillaris*), 699, 700 (anthelmintics).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

FORBUS, W. D., & DAVIS, C. L. (1946.) **A chronic granulomatous disease of swine with striking resemblance to Hodgkin's disease.**—*Amer. J. Path.* 22. 35-67. 633

A detailed anatomical and histological description is given of seven cases of a relatively rare chronic granulomatous condition of swine which, in the authors' opinion, can be distinguished from other granulomatous or neoplastic conditions recorded in swine. The strong resemblance of the morbid anatomy of this entity to that of Hodgkin's disease is emphasized.

The lesions described are confined to the lymph nodes, bone marrow, spleen, liver and kidney and in general consist of cellular infiltration and reticulo-endothelial proliferation, with the presence of multinucleated giant cells. As the proliferative reaction progresses, a hyaline reticulum is developed, with gradual disappearance of the cellular elements to leave a hyaline scar.

—W. M. HENDERSON,

cussed. In particular, the difficulties associated with the passage of the eggs from the gravid female in the heart to the trachea are emphasized. The possibility of the worms being aberrant forms of *D. viviparus* is admitted, but consideration of the differences in the character of the two habitats concerned and the difficulties arising favour the conclusion that the worms represent a new species which is named *Dictyocaulus cardiaque*.—D. W. J.

PETERSEN, A. (1941.) *Ascaris lumbricoides* L. [*Ascaris lumbricoides*.]—*Maanedsskr. Dyrlaeger*. 53. 189-230. 632

P. confirmed an earlier finding [BRIEG (1927) —personal communication] that about 44% of the pigs sent to the abattoirs in Denmark have lesions produced by *Ascaris* larvae. Adult ascarids are found in the intestines in 3-5% of the pigs all the year round. Because of extreme variability in the size of ascarids in severely infested pigs, the infestation is presumed to be acquired over a considerable period. Feeding experiments showed that the so-called cirrhosis chronica maculata of the liver is produced by *Ascaris* larvae. Some, however, of the cirrhosis cases seen in practice are caused by *Cysticercus tenuicollis* infestation. The percentage of livers condemned amounts to 2-3% throughout the year. Only young pigs are liable to the infestation under practical conditions. In Denmark the parasite is not of sufficient importance to cause unthriftiness of pigs.

—H. C. BENDIXEN.

ANON. (1946.) **Trauma and epithelioma.**—*Lancet*. 250. 169-170. 634

Chronic irritation alone will not induce cancer, but certain chemical substances will predispose the skin to cancer, which may occur long after its application. The effect that inflammation may exert in a tissue already predisposed to cancer by the action of a carcinogen is under research, the following facts being known:—(1) Inflammation by itself does not cause cancer. (2) A predisposed tissue may more speedily become cancerous if inflamed. (3) A circulating carcinogen may become concentrated in an inflamed tissue. (4) When applied directly to an inflamed tissue, a carcinogen may be retained there. (5) The appearance of neoplasm in an already predisposed tissue may be accelerated by inflammation of that tissue.

Experiments were carried out by PULLINGER [see V. B. 16. 268] in support of these conclusions, using benzpyrene on the skin of mice,

BURROWS [see *V. B.* 3. 283] showed that inflamed tissues will concentrate substance from the circulating blood and BRUNELLI (1935) demonstrated the concentration of intravenously administered oestrone in the inflamed subcutaneous tissues of rabbits.—R. F. G. SANDERCOCK.

DURAN-REYNALS, F. (1945.) **Immunological factors that influence the neoplastic effects of the rabbit fibroma virus.**—*Cancer Res.* 5. 25-39. [Author's summary copied *verbatim*.] 635

From the present and a previous investigation on the same subject it appears that following the injection of adult domestic rabbits with the virus of the rabbit fibroma no virus is ever found in the blood, generalized spread of the virus in the viscera occurs only during the first 8 days after infection, immunity to reinfection is already noticeable after 24 hours, and the antibody response is prompt and vigorous.

Following similar injections into newborn rabbits virus is detected in the blood for at least

See also absts. 609 (fibroma), 737 (pathology of tumours).

DISEASES, GENERAL

MENKIN, V. (1946.) **Chemical factors and their role in inflammation.**—*Arch. Path.* 41. 376-387. 636

This review is mainly devoted to a consideration of M.'s recent work on a leucocytosis-promoting factor (LPF), a factor which is considered responsible for the severe reaction in acute inflammation (necrosin) and an agent which causes pyrexia (pyrexin) [see *V. B.* 15. 331 and elsewhere]. The general pattern of inflammatory reactions is conditioned by these three agents, together with leucotoxin which causes increased capillary permeability and leucocyte migration. LPF causes leucocytosis in the dog, g. pig and man. Necrosin is a toxic euglobulin liberated by injured cells and can be shown to produce lesions in the liver and kidney when injected intravenously. Fever is caused by a substance which appears to act on the heat-regulating centre of the central nervous system: pyrexin is possibly the product of enzymatic activity associated with necrosin. The leucopenia which sometimes occurs in inflammation is probably caused by a heat-stable polypeptide which traps leucocytes in the vessels of the lung, liver and spleen.—E. G. W.

WAGENAAR, G. (1942.) Een onderzoek naar het voorkomen van bacteriën in het bloed bij de grote huisdieren tijdens puerperale ziekte-toestanden. [Investigation into the presence of bacteria in the blood of farm animals with puerperal diseases.]—*Tijdschr. Diergeneesk.* 69.

13 days and in the viscera for at least 21 days after injection, immunity to reinfection is not yet well established 12 days after infection, and the antibody response is slow and poor. When large amounts of virus are injected into newborn rabbits an acute, lethal disease with traits largely destructive and inflammatory, but also with typical proliferative features, results. This disease shows many analogies with the disease induced in the adult domestic rabbit by another but highly pathogenic virus, that of rabbit myxomatosis, the agent of which is a variant of the fibroma virus.

If small amounts of virus are injected into newborn rabbits a progressively growing tumor results, which induces satellite nodules, sometimes generalized fibromas, and often kills the host. In other cases the tumors regress after having attained a large size. The generalized fibromas are very similar to the generalized lesions obtained by other investigators in rabbits prepared by carcinogens and injected intravenously with fibroma virus.

338-345. [English, French and German summaries.] [Abst. from English summary.] 637

W. examined the blood of 33 cows, five horses and eight pigs with various puerperal diseases, taking samples from the jugular vein in the horses and cattle and from the ear in the pigs. Liver broth and liquor [a synthetic polymer of sodium anethol sulphinate] were used as culture media. Serious bacteraemia was observed in samples from three cows, from none of the horses and from two of the pigs.

GORDON, J., HALL, R. A., HEGGIE, R. M., & HORNE, E. A. (1946.) **A histological and bacteriological study of healing burns with an enquiry into the significance of local infection.**—*J. Path. Bact.* 58. 51-61. [Authors' summary copied *verbatim*.] 638

A small series of 2nd and early 3rd degree burns has been examined in detail, using the method of biopsy to assess the extent of the initial injury and to determine the mode of healing. Epithelialisation of 2nd degree burns takes place multifocally from the viable epithelial cells lining sweat ducts and hair root follicles. There appears to be no latent period in this process. In pure 2nd degree burns healing can occur in the presence of haemolytic streptococci and *Staphylococcus aureus*, singly or together, with little if any retardation. In mixed 2nd and 3rd degree burns; if infection becomes established in 3rd degree areas, healing of neighbouring 2nd degree areas is frequently delayed.

TATUM, H., & GINZLER, A. M. (1946.) **The traumatic effects of positive intratracheal pressures.**—*J. Lab. clin. Med.* 31. 799-805. [Authors' summary copied *verbatim*.] 639

Increased intratracheal pressure in dogs, under the conditions of this study, resulted in drop in arterial blood pressure, elevation of venous pressure, and apnea. There was no essential difference noted between the response of normal dogs and those with pulmonary edema resulting from inhalation of phosgene.

Air embolism and/or gross mediastinal and cervical interstitial emphysema occurred at about the same level of intratracheal pressure in the two groups of dogs.

The microscopic pathologic changes, other than the lesions caused by inhalation of phosgene in the one group of dogs, were also of essentially the same magnitude in the two groups of animals. These changes consisted of moderate dilatation of terminal respiratory passages, focal vesicular emphysema, and interstitial emphysema, first noted microscopically at a pressure of 50 mm. of mercury in this study. Gross mediastinal and cervical interstitial emphysema and carotid air emboli became apparent at pressures of about 80 to 110 mm. of mercury in both the control animals and in those with pulmonary edema.

The findings indicate that there is no greater hazard as a result of positive pressure inhalational therapy to lungs with edema than to normal lungs.

RYAN, A. F., & RAINEY, J. W. (1945.) **A specific arthritis with pericarditis affecting horses in Tasmania.**—*Aust. vet. J.* 21. 146-148. 640

Further case records are provided of a specific arthritis of both stifle joints, and sometimes the shoulder joints, with fever, pericarditis and sometimes peritonitis, which affected farm horses in Tasmania.—D. C. BLOOD.

DOYLE, L. P. (1945.) **Enteritis in swine.**—*Cornell Vet.* 35. 103-109. 641

D. reviews the present position of enteritis in swine in America. The condition may be due to a variety of causes and a plea is made for the development of means for differential diagnosis. The factors most likely to be concerned are improper food, food deficient in some nutritional requirement or infective agents. Among the infective agents which may be implicated are salmonella, *Actinomyces necrophorus*, an agent as yet unknown, and coccidia. On the basis of experiments made at the Indiana Experiment Station, D. doubts the importance of *S. cholerae-suis* as a primary cause of disease in pigs.

Although in some cases disease had been produced by culture in pigs immune to swine fever it had not been possible to set up the disease by

feeding emulsions of the organs from which the strains of *S. cholerae-suis* had been isolated. D. considers that the illness produced by these cultures is not analogous to any natural disease of pigs; he describes it as "a laboratory creation". *A. necrophorus* was easy to isolate from the diseased intestinal wall in many cases of necrotic enteritis. Cultures of it were pathogenic for rabbits but proved harmless for swine. [The age of the cultures used is not stated.]

The cause of swine dysentery, the symptoms and lesions of which are described, is still undetermined. The disease is infectious and readily reproduced by feeding intestinal contents or discharges from infected animals. Experiments indicate that the causative agent is limited largely to the cecum and colon. The incubation period is 7-12 days in experimental cases and 30 days or more in the field. A vibrio has been isolated, apparently in pure culture, from the wall of the colon, but technical difficulty in isolation and propagation of this organism make its causal relationship to the disease difficult to determine. Prevention of swine dysentery depends on sanitation and isolation. Field evidence suggests that carriers may be of importance. In treatment sodium chloride and alkalies are advised. Sulphonamides appear to be less effective in swine dysentery than in other forms of enteritis in swine.

—W. R. KERR.

— (1945.) **Report of special committee on swine enteritis.** Illinois State Veterinary Medical Association.—*N. Amer. Vet.* 25. 732-733. 642

The findings of this committee lay emphasis on the importance of nutrition and good herd management in the prevention of swine enteritis. Sulphaguanidine and sulphathaladine are said to give encouraging results in the treatment of the condition if pneumonic and other complications are absent.—W. M. HENDERSON.

MESSERLI, W. (1945.) **Ein Beitrag zur Fazialisparese beim Rind. [Facial paralysis in cattle.]**—*Schweiz. Arch. Tierheilk.* 87. 45-50. 643

Four cases are described of facial paralysis, a condition uncommon in cattle, which occurred in young cattle aged six months, seven months, one and a half years and three years respectively. In two cases, paralysis of the facial nerve came on suddenly, in the other two, slowly. In all four cases, the paralysis was unilateral. The chief symptom was a flow of saliva from the affected side of the mouth, which was slightly opened. In three of the animals, a ball of food was present between the cheek and the molar teeth on the affected side. The incisor teeth on this side had black discoloration, especially on the labial surface, similar to that normally seen on the molar teeth

and probably due to the lack of mechanical cleaning provided by the lower lip. The eye on the affected side appeared to be smaller, was half closed and could only be partly shut. The ear hung limply and moved only passively as the head moved. In two cases, due apparently to associated unilateral damage to the vestibular nerve, the head hung towards the affected side.

The animals lost condition rapidly, probably mainly as a result of loss of saliva, and were apathetic. Three were destroyed after 10–14 days' illness but the fourth recovered after about six months. The paralysis was of the infranuclear type in all cases. The origin in one case was an actinomycotic process in the middle ear [for details, see abstr. following], the affection probably being by way of the Eustachian tube. In another case, the ear involvement was probably due to extension of a calf diphtheria lesion, in the third case possibly to trauma, and in the fourth case possibly to cold.—E. COTCHIN.

HAUSER, H. (1945.) Zwei neurologische Fälle von Aktinomykose beim Rind. (Grosshirn, Fazialis.) [Two neurological cases of actinomycosis in cattle.]—*Schweiz. Arch. Tierheilk.* 87. 51–56. 644

A two-year-old cow appeared stupid, ate and drank little and rapidly lost flesh. Skin sensitivity was reduced, especially on the right side. The animal was blind in the left eye. Its gait was unsteady and it had marked opisthotonus. The tongue was limp and could easily be drawn from the mouth. The pressure of the cerebrospinal fluid was increased. P.M. granulomatous tissue was found in the right temporo-occipital cerebral cortex and actinomycotic granules were seen in section. No other lesions were present to indicate the source or route of infection.

In another case, an inflammatory lesion, the history of which suggested an actinomycotic origin and which had caused the observed paralysis of the facial nerve, was found in the temporal bone, protruding from the facial canal into the cerebellar cavity. The Eustachian tube appeared to be normal, and the source of the lesion was not found.

—E. COTCHIN.

EICHELBERGER, L., & ROMA, M. (1946.) An unusual case of generalized anasarca appearing in an impounded dog with cirrhosis of the liver.—*J. Lab. clin. Med.* 31. 785–792. 645

A stray Boston bull terrier had ascites and generalized anasarca. After blood and tissue had been removed for examination, the animal was killed. The peritoneal cavity contained 2 litres of ascitic fluid and fluid was also present in the pleural cavity. The liver was enlarged and cirrhotic and histological examination suggested that

there was an infection of the bile ducts, with some obstruction, secondary fibrosis and a considerable destruction of the liver parenchyma. There was no marked change in the kidneys and the heart appeared normal.

The results of various examinations made on the blood, skeletal muscle, skin and brain are given in tabular form. The serum proteins were lowered to a level where the colloid osmotic pressure of the plasma was insufficient to counterbalance the hydrostatic pressure in the capillaries: the latter pressure may have been raised above normal, as there was a possibility of heart failure with increased venous pressure. The cause of the low protein value was not determined, but the severe liver disease may have interfered with the formation of the serum proteins. The ascitic fluid protein content was low, indicating that there had been little alteration in the permeability of the capillaries. The skin and muscles contained more water than normal, chiefly extracellular; the muscle fibres themselves had lost water. Neither the cerebrum nor the cerebellum had an increased water content.—E. COTCHIN.

MOSES, C. (1946.) Role of stasis in the development of pulmonary infarcts.—*Arch. Path.* 41. 319–321. [Author's summary copied *verbatim*.] 646

Hemorrhagic pulmonary infarction could not be produced by the experimental method used in the absence of stasis and congestion in the pulmonary circulation. The observations emphasize the importance of preventing circulatory stasis not only in the systemic but also in the pulmonary circulation in order to prevent the development of hemorrhagic pulmonary infarcts.

FORMSTON, C. (1945.) Observations on subluxation and luxation of the crystalline lens in the dog.—*J. comp. Path.* 55. 168–184. 647

Observations were made on over 100 cases of luxation of the lens in the dog. The condition appears either as a subluxation, with only partial rupture of the ligamentous attachment of the lens, an anterior luxation, with the lens displaced into the anterior chamber, or a posterior luxation into the vitreous humour. The clinical manifestations of these types and the course of the disease are described in full.

The aetiology is discussed. Trauma is discounted as a causative agent owing to the marked disparity between the incidence of the two conditions, while evidence is put forward to suggest that glaucoma, which is frequently associated with luxation, is a sequel and not the primary factor. As the disease was encountered in only two breeds of dog (the wire-haired fox terrier and the Sealyham), is essentially bilateral in nature

and has been shown to be familial in some cases, the suggestion is advanced that the condition may be hereditary.—C. W. OTTAWAY.

*FISSMER, E. (1948.) Untersuchungen und Beobachtungen über Wesen und Entstehung der Schnüffelkrankheit bei Schweinen. (I. Mitteilung.) [The nature and origin of "pug nose" deformity of pigs. I.]—*Z. Tierz. Zücht-Biol.* 55. 156-170. 648

There is considerable confusion in the literature regarding the use of the term *Schnüffelkrankheit*. The two main conditions that have been so termed are (1) rhinitis and sinusitis of swine without any anatomical deformity of the nose and (2) an anatomical deformity of the bones and other structures of the nose characterized by the development of a "pug nose". This condition may have a concomitant nasal discharge, a fact that has, no doubt, led to the confusion in nomenclature.

F. deals specifically with the "pug nose" deformity. The nature of this condition has also been the subject of controversy, some authorities believing that an infectious disease is the primary cause producing a chronic malformation of the nasal structure, while others consider that the condition is an hereditary malformation [see V. B. 8. 39 & 528 and 9. 873 & 874].

The affected animal is unable to root properly because of its malformed nose and snout, the tongue hangs out of the mouth and difficulty is experienced in picking up food, with the result that growth is impaired. Measurement of the head gives a ratio of breadth of forehead to length of nose of 100 : 53 in a typical case, as compared with 100 : 88 in a normal animal.

F. considers that a predisposition to this deformity is hereditary and that the condition itself may develop secondarily to infection,

especially piglet influenza. This view is supported by an examination of the breeding records of pedigree pigs and, according to F., the only means of control is ruthless eradication of all animals affected with the deformity, of their litter-mates, and of all animals that have had affected progeny.

—W. M. HENDERSON.

OTTOSEN, H. E. (1945.) Et Tilfælde af Cor pseudobiloculare med Situs inversus og Transposition af Arterierne. [A case of cor pseudobiloculare with situs inversus and transposition of arteries in a calf.]—*Maanedsskr. Dyrlaeger.* 57. 261-273. 649

The malformation described was found in a calf that died five hours after birth. Findings included a total aplasia of the auricular septum and a pronounced hypoplasia of the right ventricle, as well as stenosis of the corresponding atrioventricular opening, pulmonary orifice and pulmonary artery. There were a number of foramina between the right and the left ventricle and a two-lobed valve in the right and a three-lobed valve in the left atrioventricular opening; because of its connexion with the place of entrance of the veins this is explained as a manifestation of situs inversus. As the aorta arises from the three-valved ventricle and the pulmonary artery from the other, a transposition of the arteries is thought to have taken place. The condition presents a considerable similarity to cases of malformation described in man by MÖNCKEBERG (1924) and called cor pseudotriloculare.—H. C. BENDIXEN.

BLOOD, D. C., & STEEL, J. D. (1946.) Defective interventricular septum in a calf.—*Aust. vet. J.* 22. 22-27. 650

A case report is given of a calf which had breathlessness, a systolic heart murmur and thrill, cyanosis and polycythaemia; P.M., it was found to have a defective interventricular septum.

See also absts. 580 (chronic pneumonia in sheep), 607 (grass sickness and "fog fever"), 626 (bronchitis), 672 (photosensitization), 701 (equine colic), 702 (choking), 721 (defects in vision), 722 (fractures).

NUTRITIONAL AND METABOLIC DISORDERS

ENGDAL, O. T., & ULVESLI, O. (1942.) Forsøk med mineraltilskudd til lam. [Experiments on mineral supplements for lambs.]—*Norg. Landbrukskøjsk. Beretn. ForForsøk.* No. 52. pp. 61. [English and German summaries.] 651

In the coastal districts of Norway ewes often put on little weight in the summer and their lambs thrive poorly, growing little during the autumn and following winter. The authors describe work undertaken to determine whether the addition of supplements of calcium and phosphorus or of copper or cobalt to the ordinary diet of lambs

caused improvement in growth and health.

Group experiments with lambs were carried out for three years. In the first and third years the experiments lasted 140 days and in the second year 180 days. In the first year there were six and in the following years eight lambs in each group. Group A, the control group, received hay, turnip, concentrates and a supplement of 5 g. of NaCl per head daily. Group B received a similar basal ration with a daily 15 g. supplement consisting of equal parts by weight of ground CaCO₃, CaHPO₄ and NaCl. Group C received diet

similar to B's with trace elements added. The trace elements added in the first year were Cu, Co, Mn, Fe, Zn and Ni; in the second year Cu, Co, Mn and Fe, and in the third year Cu and Co. Group D received as much hay as they would eat, turnip, concentrates and mineral supplements similar to Group B and were allowed to graze when weather permitted. These animals were included in the experiments in the second year. Group E was included in the experiment for the last year. These lambs had the same food as Group A with a mineral supplement of 5 g. of NaCl and the same quantities of Cu and Co as for Group C in the third year. The haemoglobin content of the blood was estimated several times each year for some of the lambs in each group. P.M. examinations were made of the alimentary canal, lungs and liver. Of each of four lambs in Group A and of two lambs in each of the other groups, a radius was analysed to find if there were any differences in the deposition of Ca. It was found that the addition of Ca and P did not appear to have any effect on the growth and health of the lambs, but that the lambs in groups C and E to which supplements of Cu and Co had been given, gained weight with a lower consumption of food per kg. gain and were in better general health than the others. The relative gains for Groups A, B and C were 100:105:147 respectively. The percentage of haemoglobin was also slightly higher for the groups receiving supplements of Cu and Co than for the other groups. There were no significant differences between the groups in the amount of Ca found in the radius.—M. E. R.

BRUCE, H. M., KON, S. K., WATSON, J. V., COTCHIN, E., & WHITE, E. G. (1946.) **Observations on perosis occurring in chicks used for vitamin D₃ assay.**—*J. comp. Path.* 56. 53–62. 652

In routine tests of vitamin D₃, radiographic examination of 5,720 chicks showed abnormalities of the joints occurring at 5–6 weeks of age in 107. The changes consisted of swelling and bending of the upper end of the metatarsus, which interfered with the measurement of the tarso-metatarsal distance essential for the application of the technique for estimating vitamin D₃. Histological and radiographic studies of the changes are reported.

It was considered that an unsuitable Ca:P ratio in a basal diet was an important causative factor but deficiencies of Mn and choline were apparently the most important causes of the disease. The amounts required for prevention are Mn 0.003–0.01% and choline 0.2%. Two diets were tested, the levels of Ca and P in each

being unlikely to cause the disease. One diet contained 45–50 and the other 20–30 p.p.m. of Mn. The choline content of the diets was not determined but the inclusion of 3% dried yeast in the second diet makes it improbable that choline deficiency was a causal factor. The distribution of the lesions in relation to the two diets is not clearly indicated, but a footnote states that the addition of 0.2 g. manganese sulphate per kg. of diet entirely prevented the occurrence of perosis on the ration with lower original content of manganese. Choline did not prevent perosis in these studies.—A. M. COPPING.

WINTROBE, M. M., STEIN, H. J., FOLLIS, R. H., Jr., & HUMPHREYS, S. (1945.) **Nicotinic acid and the level of protein intake in the nutrition of the pig.**—*J. Nutrit.* 30. 395–412. 653

Young pigs fed a high protein (26.1%) diet deficient in nicotinic acid thrived well with no signs of a nutritional deficiency. When the protein content of the same diet was decreased to 10%, the omission of nicotinic acid from the diet caused nutritional deficiency characterized by poor growth, rough coat, diarrhoea, poor appetite and anaemia. The urinary excretion of derivatives of nicotinic acid was markedly decreased in the latter group. The effect of a deficiency of nicotinic acid in the diet increases when the protein content is low.—E. KODICEK.

WILSON, H. E., SASLAW, S., & DOAN, C. A. (1946.) **The effect of folic acid (*Lactobacillus casei* factor) in nutritional hematopenia of monkeys.**—*J. Lab. clin. Med.* 31. 631–642. [Authors' summary copied verbatim.] 654

Five monkeys (*Macaca mulatta*) on vitamin B deficient basic diets supplemented in four cases by all of the known B vitamin fractions except *L. casei* factor developed clinical and hematologic evidences of nutritional deficiency.

Three of these animals treated with a yeast autolysate containing *L. casei* factor showed dramatic clinical remissions and the re-establishment of a normal hematopoietic equilibrium.

Two of these animals treated with purified crystalline *L. casei* factor from liver showed unequivocal clinical and panhematopoietic remissions after failure of adenylic acid to evoke more than a very transitory, noncumulative, or sustained leucocytosis.

These studies indicate that a monkey under the conditions of these observations may develop a deficiency in one or all of the bone marrow elements, any one or all of which may respond promptly and completely to *L. casei* factor activity.

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

ANON. (1945.) **Ritual dehydration.**—*Brit. med. J.* June 23rd. 881. 655

Oedema fluid may become concentrated as a result of loss of water through the skin when the water and salt intake is restricted on medical advice. The kidneys can perform their work of regulating the electrolytic balance of the body satisfactorily only if sufficient water is available. When the oedema fluid is concentrated, tissue cells are dehydrated and thirst is experienced; if the patient drinks, the tissue cells take up water and so the oedema is increased. If water is taken over and above the requirements of the cells, then there is sufficient surplus to allow the kidneys to undertake their normal function, electrolytic balance is restored and oedema fluid is excreted.

SCHEMM (1942-44) successfully adopted this hypothesis as a basis for the treatment of oedematous conditions. He allows patients to drink as they desire and restricts salt intake.—A. T. P.

MUHRER, M. E., & HOGAN, A. G. (1945.) **Effect of thiouracil on growing swine.**—*Proc. Soc. exp. Biol., N.Y.* 60. 211-212. 656

Since hypothyroidism decreases the metabolic rate and might therefore be expected to result in more efficient fattening, the effect of thiouracil, which is goitrogenic was studied in fattening pigs. Four pairs of Chester White × Poland China pigs were paired according to weight, sex, age and type. Both pigs of each pair received the same ration, but one received 0.2% thiouracil in addition. The pigs which did not receive thiouracil had better appetite, were more energetic and gained less weight than the thiouracil fed pigs. The weight gain of the latter was not a true indication of growth. The heavier thiouracil fed pigs were wider, shorter in body length and not as tall as the controls. They were an example of retarded growth with rapid gains in weight due to the deposition of an excessive amount of fat.—R. SCARISBRICK.

HAAS, E. (1946.) **On the mechanism of invasion.**
I. Antinvasin I, an enzyme in plasma. II. Proinvasin I, an enzyme in pathogenic bacteria and in venoms. III. Antinvasin II, an enzyme in plasma.—*J. biol. Chem.* 163. 63-88, 89-99 & 101-110. 657

I. Normal blood plasma contains an enzyme, antinvasin I which destroys hyaluronidase. Antinvasin I is present in the blood plasma of all animals but becomes reduced in infection. It attacks hyaluronidase from all sources.

II. Pro-invasin I occurs in many pathogenic bacteria (*e.g., Staphylococcus aureus*) which produce hyaluronidase and in snake venoms. Pro-invasin I destroys antinvasin I, the natural defence

substance present in plasma. Pro-invasin I therefore protects hyaluronidase from destruction by the normal enzyme present in plasma.

III. Plasma contains another enzyme, antinvasin II, which destroys the bacterial enzyme pro-invasin I. It is possible that two more enzymes participate in this system, that some bacteria (*e.g., Staph. aureus*) also contain pro-invasin II and that plasma contains antinvasin III. The cause of an invading infection depends upon the amount of all the enzymes present.—E. BOYLAND.

ROBSCHUIT-ROBBINS, F. S., MILLER, L. L., & WHIPPLE, G. H. (1946.) **Hemoglobin and plasma protein production.** Various proteins, concentrates, and digests influence blood protein production in anemia and hypoproteinemia.—*J. exp. Med.* 83. 463-475. [Authors' summary slightly amended.] 658

Given healthy dogs, fed abundant iron and protein-free or low protein diets, with sustained anemia and hypoproteinemia due to bleeding, we can study the capacity of these animals to produce simultaneously new hemoglobin and plasma protein.

The reserve stores of blood protein-producing materials in this way are largely depleted, and levels of 6 to 8 gm. per cent for hemoglobin and 4 to 5 gm. per cent for plasma protein can be maintained for considerable periods of time. These dogs are very susceptible to infection and to injury by many poisons. Dogs tire of these diets and loss of appetite terminates many experiments. These incomplete experiments are not recorded in the present paper but give supporting evidence in harmony with those tabulated.

Under these conditions (double depletion) the dogs use effectively the proteins listed in the text of the article—egg, lactalbumin, meat, beef plasma, and digests of various food proteins and hemoglobin.

Egg protein at times seems to favor slightly the production of plasma protein when compared with the average response.

Various digests and concentrates compare favorably with good food proteins in the production of new hemoglobin and plasma protein in these doubly depleted dogs.

Whole beef plasma by mouth is well utilized and the production of new hemoglobin is, if anything, above the average—certainly plasma protein production is not especially favored. "Modified" beef plasma by vein causes fatal anaphylaxis.

Hemoglobin digests are well used by mouth to form both hemoglobin and plasma protein. Supplementation by amino acids is recorded.

Methionine in one experiment may have been responsible for a better protein output and digest utilization.

HUEPER, W. C., & DE CARVAJAL-FORERO, J. (1944.) The effects of repeated irradiation of the gastric region with small doses of roentgen rays upon the stomach and blood of dogs.—*Amer. J. Roentgenol.* 52. 529–534. [Abst. in *Biol. Abstr.* Sect. F. 19. No. 3. 2, slightly amended.] 659

Seven mongrel dogs were subjected to a series of X-ray exposures over the gastro-duodenal region, the rest of the abdomen being protected by lead. When a total of 4,875 r., was administered in small individual doses within 25 weeks, only minor changes were found in the gastric mucosa, with a moderate and transitory anaemia. A total dose of 6000 r., within four weeks, the individual doses being 300 r., produced marked loss in body weight, moderate to severe secondary anaemia and perforating gastric ulcers.

*ENGELMANN, C. (1942.) Über den Geschmacksinn des Huhnes. [Sense of taste in hens.]—*Forschungsdienst.* 13. 363. [Abst. from abst. in *Dtsch. tierärztl. Wschr.* 51. 13–14.] 660

Hens were apparently able to distinguish salty, sour and bitter liquids but seemed to have no selective taste for cereal grains, being influenced in their choice by the size, colour and smoothness.

—G. HUEHNS.

GRUENWALD, P. (1946.) Structure of the testis in infancy and in childhood. With a discussion of the so-called underdeveloped testis.—*Arch. Path.* 42. 35–48. [Author's summary copied verbatim.] 661

The minute structure of the testis in infancy and childhood is described with regard to changes in the sex cords or seminiferous tubules, the connective tissue and the interstitial cells. It is found that the range of variability is wide, so that it is impossible to correlate definite morphologic stages with closely limited age periods. Of all changes described, those in the intralobular connective tissue are the most reliable when one comes to correlate age and structure of immature testes.

Secondary sex cords, forming groups in the tunica albuginea, occur in normal testes of infants as well as in testes of fetuses.

The number of interstitial cells in the testes of newborn infants is variable but usually large. It is perhaps larger in the case of premature infants than in that of infants born at term. However, this difference is not sufficiently great and constant to be regarded as a sign of maturity.

The literature on so-called underdeveloped testes has been critically reviewed and the conclusion reached that if the criteria are properly

chosen, the incidence of this abnormality is not nearly as great as has often been suggested.

CAIRY, C. F. (1945.) The colostrum pregnancy test in cattle.—*Amer. J. vet. Res.* 6. 252–256. 662

322 tests on 35 cows and 17 tests on two "free-martins" were carried out with various types of colostrum antigen. The "colostrum" used is not the ordinary *postpartum* colostrum, but the fluid which can be expressed from the udder before parturition in heifers pregnant with their first calf. It was collected between the fifth and eighth months of pregnancy for these experiments. To make the test fluid the "colostrum" was diluted with an equal volume of sterile normal saline, filtered through a Berkefeld filter and 0.1 ml. of a 1% solution of methiolate added to each 10 ml. Various dilutions, namely, 1:1, 1:3, 1:7 and 1:15, were tested. The injections were made into the mucosa 6–12 mm. inside the vulva orifice. Readings were taken 10, 30 and 60 min. after the injection and unless an easily recognized reddening or swelling developed the cow was considered pregnant.

There were marked differences in responses of some animals to certain of the antigen preparations. 172 correct and 150 incorrect tests were obtained. Of the first tests made on each animal, omitting those made within 30 days of parturition, 35 were correct and 18 incorrect.

It is concluded that the reaction is not sufficiently specific to be used as a test for pregnancy in the cow.

[A similar conclusion was reached by ASDELL *et al.* (1942.) *Rep. Cornell agric. Exp. Sta.* pp. 101–102.]—A. T. COWIE.

COLLERY, L. (1944.) The electrical production of semen in the guinea pig (*Cavia cobaya*) and the characters of the ejaculate.—*Proc. R. Irish Acad.* Sect. B. 50. 1–14. 663

A description is given of the apparatus and technique for obtaining semen from the g. pig by electrical stimulation. In C.'s experiments the volume of ejaculate was usually 0.2–0.5 ml. and the total spermatozoa counts varied from 0.5 to 3–4 millions, but these figures are not thought very reliable because of the characteristic semi-solid plug found in g. pig ejaculate and its tendency to occlude considerable numbers of sperm. In most cases the motility exceeded 90%.

C. discusses the morphology of the sperm including the phenomenon of "rouleaux formation", resulting from the cohering of spermatozoa by their acrosomes, and considers its significance. Attention is also drawn to the occurrence of polymorphonuclear leucocytes and epithelial cells in the sperm of apparently healthy animals. Some

indication is given of the probable significance of the loss of the acrosome and of the middle piece head.—A. EDEN.

MEYER, B. J., & MEYER, R. K. (1944.) **Growth and reproduction of the cotton rat (*Sigmodon hispidus hispidus*) under laboratory conditions.**—*J. Mammal.* 25. 107–129. 664

Because of the interest in the cotton rat following the discovery by ARMSTRONG (1939) that it differed from other rodents in susceptibility to poliomyelitis virus, later, by FOSDICK (1941), that it also differed in susceptibility to the rickettsia causing typhus, it was studied with especial reference to its suitability as a laboratory animal.

Under laboratory conditions, cotton rats were found to breed freely throughout the year. The period of gestation was 27 days and the average litter about six. *Post-partum* ovulation occurred after an interval of 6–12 hours and copulation after 3–6 hours. The young were normally weaned at 15–25 days, but could be weaned artificially at five days. The testes of most males descended at 20–30 days of age and the vaginae of most females opened at 30–40 days of age.

Deaths as a result of fighting are common, but can be avoided by separating the sexes at the time of weaning and pairing breeding stock at the age of 50 days.

No difficulty was encountered in setting up and maintaining laboratory colonies. Details are given of types of cages used and of diet.—D. D. O.

WISLOCKI, G. B., & DEMPSEY, E. W. (1946.) **Histochemical reactions of the placenta of the pig.**—*Amer. J. Anat.* 78. 181–225. 665

This is one of a series of studies from the Department of Anatomy, Harvard Medical School, dealing with the cytology and histochemistry of the placenta of animals. Previous articles have dealt with the cat, rat, g. pig, sow and the human placenta.

The chorion of the pig was found to have three specialized regions, each characterized by certain morphological and histochemical features. The chorionic ridges or villi probably represent the sites of transference of more readily diffusible substance into the foetus; in the cells there are pronounced basophilia, a moderate amount of iron and traces of glycogen but no stainable fat or alkaline or acid phosphatase. The cells of the fossae between the ridges show brush borders and terminal bars; the distal third of the cell is acidophilic and the rest is basophilic and contains colloid droplets and crystals; the cells also contain alkaline phosphatase (brush border and distal third of the cell), glycogen, iron and lipid droplets. These cells probably take up and metabolize the less diffusible substances. The

areolae, cone- or cup-shaped depressions occurring opposite the uterine glands, contain in their lumen a serous secretion derived from these glands and rich in iron and acid phosphatase. The cells of the areolae also contain iron and acid phosphatase and probably originate from the secretion of the uterine glands. The stroma of the chorion adjacent to the allantois contains calcium, alkaline phosphatase, glycogen and iron.

The findings in the sow are compared with those in other species. The main features in the sow are the great activity of the uterine glands with their abundant secretion of acid phosphatase and iron, the apparent absorption of iron throughout the whole chorion, although mainly by the areolae, and the temporary storage of calcium in the stroma of the chorio-allantois, which seems to suggest a connexion with the process of calcification.

The features described in the text are illustrated by a series of 29 black and white and coloured photographs and drawings.—E. G. W. BOYLAND, E. (1946.) **The composition of bovine cervical mucins and their reaction with oxidizing agents.**—*Biochem. J.* 40. 334–337. 666

Analyses were made of cervical mucins of cows in oestrus and dioestrus and of one pregnant cow. Oestrous mucin contained 1.0–1.5% dry matter, dioestrous 2.3% and pregnant mucin, 4.5%, but the most important differences lay in the nitrogenous components. Oestrous mucin contained little nitrogen and relatively more carbohydrate and less protein and glucosamine than the other two types. The carbohydrate in oestrous mucin may be a muco polysaccharide, whilst the mucins of dioestrus and pregnancy contain both polysaccharide and protein. None of these mucins was attacked by hyaluronidase but all were dissolved by neutral oxidizing agents although not by inorganic reducing agents. Hypochlorites and hypobromites were the most satisfactory solvents for all types of mucin; in fact the most suitable solvent was a solution of NaOCl in a borate buffer at pH 8.5.

NaOCl is a satisfactory antiseptic particularly against *Trichomonas foetus*. It is suggested that such a solution, prepared by diluting one vol. of commercial NaOCl (containing 10% available chlorine) with 9 vol. of 0.1 M boric acid might be of value as an irrigation fluid in the treatment of bovine trichomoniasis.—A. EDEN.

SPALATIN, J. (1944.) **Besteht ein Zusammenhang zwischen der pH-Zahl der Fäzes und dem Bakteriophagengehalt bei verschiedenen Tieren? [Is there a relationship between pH value and bacteriophage content of the faeces of different animals?]**—*Zbl. Bakt. I. (Orig.)* 151. 319–322. 667

S. found that the pH of the faeces of a number of the domestic animals and poultry could be classified into three groups, those of the herbivores having a markedly alkaline reaction, pH 8.0-9.5, of the carnivores, acid, pH 6.0-7.0 and of the omnivores, faintly acid to faintly alkaline, pH 6.5-

See also *abst.* 735 (physiology of farm animals).

8.0. The bacteriophage content of the faeces was determined against ten strains of the coli-typhoid-paratyphoid group. There was no clear correlation between the pH and bacteriophage content although, in general, the faeces of herbivores contained least bacteriophage.—W. M. HENDERSON.

POISONS AND POISONING

AMOR, A. J., & PRINGLE, P. (1945.) **A review of selenium as an industrial hazard.**—*Bull. Hyg., Lond.* 20. 239-241. 668

In this review, primarily concerned with the toxicity of selenium in man, the effects produced in cattle grazing on seleniferous soil in Wyoming, South Dakota and Nebraska are mentioned. It is also stated that in certain areas in Ireland symptoms suggestive of chronic selenium intoxication, *viz.* loss of hooves, horns and hair, have been described in cattle. In the Irish areas the condition is said to be known as "dog murrain".

Livestock ingest selenium by eating certain plants which have the property of extracting it from the soil.

The distribution of the element in various organs is discussed and a table showing the selenium content of various tissues of ten experimental cases in dogs is reproduced from MOXON [*V.B.* 10. 296]. The pathological findings in experimental cases are briefly discussed.—M. C.

TELFORD, H. S., & GUTHRIE, J. E. (1945.) **Transmission of the toxicity of DDT through the milk of white rats and goats.**—*Science.* 102. 647. 669

When a balanced chicken mash containing 0.1% D.D.T. was fed to three adult rats each with a one-day-old litter, all died within 18 days, except one adult and one nursing. Nine adult rats fed solely on goats' milk from animals receiving daily oral doses of 1 g. of D.D.T. per 8-9 lb. body weight died within 2-29 days exhibiting typical symptoms of D.D.T. poisoning. Milk obtained from goats which had received these dosages for 21-26 days was much more toxic than milk from animals subjected to shorter periods of treatment before the milk was used.

Frequent administration of D.D.T. [dose not stated] suppressed milk secretion in goats, lactation generally ceasing between the 21st and 28th day of dosing. In some animals there were no toxic symptoms and all recovered. There is evidence that the toxic principle is concentrated in the fat globules of the milk. Milk from goats sprayed daily for 42 days with 150 ml. of a 10% D.D.T. emulsion produced no toxic symptoms in rats or in a young kid allowed to suck a sprayed goat.—R. ALLCROFT.

NIEUWLAND, I. C. H. (1941.) Over het gebruik van bloembollen als veevoeder. [The use of bulbs in cattle feed.]—*Tijdschr. Diergeneesk.* 68. 359-368 & 369. [English, French & German summaries.] [Abst. from English summary.] 670

In view of the shortage of fodder, bulbs of the tulip, hyacinth and narcissus, corms of the crocus and the underground stem of the gladiolus were used as a supplement to cattle rations. Serious symptoms occurred after narcissus bulbs had been fed. The literature indicates that both narcissus and hyacinth bulbs are toxic.

FRAPS, G. S., & WENDER, S. H. (1944.) **Studies on toxic substances of locoweeds, *Astragalus earlei* and others.**—*Bull. Tex. agric. Exp. Sta.* No. 650. pp. 23. 671

In this study a concentrated extract called "locoine" was treated with silicotungstic acid. The compounds precipitated were toxic but produced few symptoms of locoism; the filtrate was toxic and physiologically active. On treatment with benzoyl chloride the filtrate produced benzoylated and non-benzoylated fractions, both of which were toxic to cats. Chromatographic adsorption analysis of the saponified benzoylated fraction on aluminium oxide indicated the presence of two different compounds. The toxic portion of the non-benzoylated fraction was not adsorbed by aluminium oxide. It was precipitated by silver nitrate, but not by flavianic acid. Chromatographic adsorption analysis of the filtrate from the flavianic acid treatment on aluminium oxide separated two compounds.

Every active fraction had the same general type of spectrum absorption curve although there were differences in detail. Several closely related but different poisons appear to be present in locoweeds.—H. PAVER.

ROCHA E SILVA, M. (1943.) Em torno da etiologia da doença de fotosensibilização produzida pelo *Holocalyx glaziovii*. [Concerning the aetiology of the photosensitization produced by *H. glaziovii*.]—*Biológico, S. Paulo.* 9. 187-194. 672

The symptoms produced in the ruminant in photosensitization following ingestion of *Holocalyx glaziovii* are not apparently the result of jaundice,

since liver involvement is not a feature of the early experimental disease, which closely resembles the natural disease.

The liver involvement, which takes place after the primary symptoms of photosensitization are evinced in the natural disease, causes an accumulation of phylloerythrin (a porphyrin), in the tissues. This fluorescent pigment, a normal product of chlorophyll metabolism in the bovine, aggravates the symptoms of the disease. Spectroscopic examination of normal bovine bile reveals great variation in the phylloerythrin content which may account for individual susceptibility to photosensitization.

Hydrogen cyanide, released by the cyanogenetic glucoside in *Holocalyx glaziovii*, stimulates the progress of the disease, particularly when it is released slowly and in fairly small doses, as it is in the rumen in the natural disease.—I. W. J.

GRASSET, E., SCHAAFSMA, A., & HODGSON, J. A. (1946.) **Studies on the venom of South African scorpions (*Parabuthus*, *Hadogenes*, *Opisthophthalmus*) and the preparation of a specific anti-scorpion serum.**—*Trans. R. Soc. trop. Med. Hyg.* **39**, 397–421. **673**

The toxic effects are described of the venom of three South African scorpions administered to mice, g. pigs, rabbits and pigeons by intracerebral, intravenous, intramuscular, subcutaneous and intradermal routes. Accompanying tables give the M.L.D. of the venom of each species for each animal and each route.

Venom was collected from the much sclerotized telsons of *Parabuthus* (Buthidae) by snipping off the tip and pipetting; from *Opisthophthalmus* and *Hadogenes* (Scorpionidae), by forceps pressure which evacuated venom into watch-glasses. Venom, air-dried, keeps potency well but is labile in the liquid state and should be reconstituted in saline only when required. Boiling for 90 min. caused only limited destruction.

Parabuthus yielded on an average 4.8 mg. dried venom. Persons affected had neurotoxic symptoms of progressive paralysis, dyspnoea and death. *Opisthophthalmus* yielded 1.4 mg. and *Hadogenes* 2.7 mg. These venoms also produced neurotoxic effects but these were overshadowed by an intense haemorrhagic phenomenon with infiltration, necrosis and sloughing of the area of injection: this was especially marked with *Opisthophthalmus*.

Serum from a partially hyperimmunized horse gave protection to mice on injection of 3 M.L.D.'s of *Hadogenes* venom. No heterologous neutralization of scorpion venom was exhibited by several snake antivenenes and only limited neutralization by two scorpion antisera (*Buthus* and *Tityus*).

In human beings serum treatment was of definite therapeutic value.—T. SPENCE.

MORE, R. H., McMILLAN, G. C., & DUFF, G. L. (1946.) **The pathology of sulfonamide allergy in man.**—*Amer. J. Path.* **22**, 703–735. **674**

Examination of 875 autopsy records of patients who had been treated with sulphonamides revealed 22 cases with lesions which could reasonably be attributed to the sulphonamide treatment. It is considered likely that in seven cases the lesions caused death, that in seven cases they were a major factor in its causation, and that in the remaining eight cases they were probably of no great importance. The lesions found included:—focal or diffuse necrosis of the liver (three cases), focal necrosis of bone marrow (three cases), microscopic granulomatous foci in various organs, mainly heart, liver and kidney (13 cases), interstitial inflammatory infiltrations—heart, kidney and liver (11 cases), multiple inflammatory lesions involving small vessels (seven cases), “trabeculitis” of the spleen (six cases), and nephrosis (one case). The granulomatous lesions have recently been described by other workers, but “trabeculitis” of the spleen has not been recorded before: the other lesions are well recognized in sulphonamide poisoning.

The essential nature of the lesions consists in necrosis with activity of the reticulo-endothelial system and as there is always an association with sulphonamide hypersensitivity, the authors consider the lesions to be a manifestation of allergy.

—E. G. WHITE.

FRENCH, A. J. (1946.) **Hypersensitivity in the pathogenesis of the histopathologic changes associated with sulfonamide chemotherapy.**—*Amer. J. Path.* **22**, 679–701. **675**

This article is based on a study made at the Army Institute of Pathology, Washington, during 1937–43, on 76 human beings who died after sulphonamide therapy.

In a wide variety of tissues there was infiltrations of eosinophile histiocytes. Vascular lesions consisting of fibrinoid necrosis, endothelial oedema and proliferation occurred in the heart and in some other organs. Focal haemorrhages were found in the heart (subendocardial and subepicardial) and renal pelvis, and in the lungs there were interstitial pneumonitis and haemorrhage by diapedesis. The distal convoluted and the collecting tubules of the kidney had sulphonamide crystals and calcium deposition. Skin reactions were the most striking evidence of sensitivity to the sulphonamide drugs and it is suggested that any skin reaction more severe than simple erythema should be taken as contraindicating the continued use of the drugs; substitution of a different sulphonamide appeared

to reduce the danger, but even then a severe or fatal reaction sometimes occurred. The widespread prophylactic use of sulphonamides may give rise to many cases of sensitization and the possible danger of the indiscriminate use of the drugs for minor ailments is stressed.—E. G. W.

ANON. (1943.) **Sulphonamides and nervous tissue: a warning.**—*Army Med. Dep. Bull.*

No. 19. pp. 11–12. London: War Office. 676

The effects of treating nervous tissue with sulphonamides are discussed. Cases are reported in human beings, of head wounds where local sulphonamide treatment of brain surfaces was followed by unsatisfactory developments sometimes ending fatally; of lesions following intrathecal injections of sulphonamides; of peripheral nerve palsy following injections of sulphonamides,

See also absts. 524 (silicosis and TB), 545 (food poisoning in cattle), 580 ("bouhite" as a chronic poisoning).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

COOPER, K. E., & WOODMAN, D. (1946.) **The diffusion of antiseptics through agar gels, with special reference to the agar cup assay method of estimating the activity of penicillin.**—*J. Path. Bact.* 58. 75–84. [Authors' summary copied verbatim.] 677

The application of a theoretical formula to agar cup assay methods is suggested.

This formula has been shown to apply to the diffusion of crystal violet through nutrient agar and can be adapted to explain the inhibition zones on *Staphylococcus* agar cup plates.

The formula explains many of the published facts concerning the factors affecting the estimation of penicillin by this method.

Its application to penicillin standard curves enables the limits of their accuracy to be seen and allows a more detailed analysis of the factors affecting (a) diffusion and (b) antiseptic action.

HANSON, H. J., MYERS, W. G., STAHLY, G. L., & BIRKELAND, J. M. (1946.) **Variation in *Penicillium notatum* induced by the bombardment of spores with neutrons.**—*J. Bact.* 51. 9–18. [Authors' summary slightly amended.] 678

Marked variation appeared in cultures from spore suspensions of *Penicillium notatum* which were exposed to bombardment with slow neutrons for periods of time ranging from 1 hour through 184 days, and the number of variants increased as the time of exposure was lengthened.

Actively growing cultures which were treated with slow neutrons for 3 hours showed no definite evidence of induced variation.

Variation similar to that induced with slow neutrons occurred when moist and dry spores were bombarded with fast neutrons (energies up

these accidents occurring without direct injury to the nerve at the time of injection.

It was found that large applications of sulph-anilamide powder in the thigh of the rabbit, in the vicinity of the sciatic nerve destroyed the nerve by prolonged diffusion of the drug in saturated solution through it. It is recommended that when sulphonamides must be injected intramuscularly, the injection should be made into muscles as remote as possible from any peripheral nerve and care be taken to distribute the solution through different parts of the muscle. The fact that sulphonamides can diffuse through the sheath of a nerve should be borne in mind when applying such drugs to wounds in the neighbourhood of main nerve trunks. The layer of applied sulphonamide should be a thin film.—E. M. J.

to 24 Mev) [a measure of electron volts] for 15 and 30 minutes; however, an exposure of 180 minutes was lethal to all spores.

Isolation and study were made of 150 variants which are characterized by differences in such aspects as color, texture, rate and quantity of vegetative growth and of sporulation, color and amount of transpired fluid, and color of the reverse of the colonies.

A screening test, surface cultivation, and preliminary tests in submerged cultivation showed that the variant strains differ greatly in their capacity to produce penicillin, for some no longer possess this property whereas others give yields considerably higher than those obtained from the parent culture.

Comparative studies on the morphology and the production of penicillin in surface culture showed the parent strain and a buff-coloured variant to be nearly identical except for color.

No qualitative differences were observed when the inhibitory substances produced by 62 variants was tested against 10 species of bacteria.

MILLER, A. K. (1945.) **The effect of succinyl-sulfathiazole and phthalylsulfathiazole on the bacterial flora of rat feces.**—*J. Nutrit.* 29. 143–154. 679

When synthetic diets containing either succinylsulphathiazole or phthalylsulphathiazole were fed to rats, signs of nutritional deficiency developed which could be corrected by feeding biotin and folic acid. The administration of the sulphonamides decreased the coliform count of the faeces without changing the total aerobic or total anaerobic counts of the faeces. The sulphonamides appeared to reduce the synthesis of folic acid even

by sulphonamide-resistant strains.—E. BOYLAND.

RICHOV, R., & HOLSTEIN, G. (1941.) Contribution à l'étude des mammites de la vache et, en particulier, de la mammite staphylococcique. Son traitement par l'anatoxine spécifique. [*Staphylococcal mastitis. Treatment with anatoxin.*]—*Rec. Méd. vét.* 117. 329-338. 680

Staphylococci were recovered from 14 out of 22 milk samples from animals with mastitis, as well as from 11 out of 53 milk samples from apparently normal udders. Twenty-two infected cows were treated with 2% alum toxoid in three doses (10, 15, and 20 ml.) given at intervals of five days. Ten days after the last subcutaneous injection of toxoid no staphylococci could be found in the milk of 16 of them. The value of toxoid therapy was further confirmed by the results obtained in six cases of staphylococcal mastitis occurring after an outbreak of F. & M. disease. In very acute cases, the authors suggest the simultaneous use of both serum and toxoid.

Following toxoid treatment the antitoxic titre in the blood serum was 10-140 anatoxin units per ml. and that of the milk varied between 0.05 and 6 anatoxin units per ml.—M. L. LEVI.

CHRISTOFFERSEN, P. (1942.) Nogle Desinfektionsforsøg med Fenymerkuriacetat over for Miltbrandssporer. [*Disinfection trials with phenylmercuric acetate on anthrax spores.*]—*Maanedsskr. Dyrlæger.* 54. 52-64. 681

C. carried out numerous tests with phenylmercuric acetate and found that suspensions of anthrax spores and liver or spleen from infected mice, which had been incubated *in vitro* to allow sporulation, could be killed in 5 min. by a 1:2,000 solution.—J. E.

CALLOMON, F. T., & RAIZISS, G. W. (1946.) Diaminodiphenylsulfone derivatives. The therapeutic effects of two new derivatives in experimental tuberculosis.—*Amer. Rev. Tuberc.* 53. 374-384. [Spanish summary.] [English summary copied *verbatim*.] 682

Two new compounds have been subjected to this experimental study; their effectiveness and toxicity were determined and compared with diasone. One of the two new compounds was No. 2412, the other No. 3206 of the Dermatological Research Laboratories, Philadelphia (Division of the Abbott Laboratories, North Chicago, Illinois). The chemical structures and properties have been described.

We have interpreted the results obtained under the conditions of our experiments as indicating:

1. A marked deterring effect on the development of tuberculosis of the new product No. 2412, which proved to be equal to diasone when given

in a somewhat lower dosage for a similar period of treatment.

2. A therapeutic effectiveness which proved to be the same whether drug diet was started three days or thirty days after inoculation.

3. The superiority of No. 2412 and diasone over No. 3206.

4. Product No. 2412 chemically is 2 hydroxy benzaldehyde, derivative of diaminodiphenylsulfone. It is superior to diasone in its stability to oxidation. Its chemical and biological properties are not affected on exposure to air.

5. Experiments on the chronic toxicity of diasone for guinea pigs indicate that the toxicity is very low. This confirms the findings of Raiziss, Severac and Moetsch [see *V. B.* 16. 26] for mice, rats, rabbits and dogs.

6. The blood levels obtained with diasone in guinea pigs are comparatively low and of the order of those found for mice, rabbits and dogs.

7. Product No. 2412, similar to diasone, exhibited low chronic toxicity for guinea pigs accompanied by low blood levels.

8. In our experiments, product No. 3206, although given in a lower dosage than No. 2412 and diasone, showed a greater toxicity.

9. The inclusion of product No. 2412 with other sulfone compounds in further investigation appears justified.

SMITH, H. C. (1945.) Experimental work with sulfa compounds in pulmonary and enteric infections in swine.—*M[ich.] S[t.] C[oll.] Vet.* 5. 104-107 & 123. 683

The authors describe their experiences in the use of the agglutination test for swine erysipelas devised by SCHOENING *et al.* (1932). Their work was mainly concerned with results obtained from several thousands of serum samples and observations made on a large pig farm where swine erysipelas was known to exist. Their results were confused by the presence of other conditions causing mortality in particular groups under consideration and the paucity of P.M. examinations of known reactors.

Although the control of swine erysipelas by the aggl. test was not successful in this farm over the four year period of the experiment, certain findings are given, proving that the aggl. test has a practical application in the control of swine erysipelas when strict adherence to isolation and elimination can be carried out. S. was unable to show that contaminated ground bore any real significance in the experiment but found that reactors were animals affected with a chronic form of the disease and acted as dangerous spreaders of infection.—W. R. KERR.

ORDAL, Z. J., & MEYER, E. (1946.) The effect

of streptomycin on *Proteus* infections of the chick embryo.—*J. Bact.* 52. 67–70. [Authors' summary copied verbatim.] 684

Proteus vulgaris produces a rapidly fatal infection in 11-day-old chick embryos, whereas those 16 days old are relatively resistant.

Streptomycin in doses of 1,000 units or more is necessary to arrest 18-hour infections. The drug is considerably more effective when administered 6 hours after infection. Two hundred and fifty units in 1 dose or 150 units in 3 daily doses served to protect approximately 50 per cent of the embryos. Larger doses when administered early not only gave protection but in addition eliminated the organism from the embryo.

BROWNING, C. H., CALVER, K. M., LECKIE, M. W., & WALLS, L. P. (1946.) Phenanthridine compounds as chemotherapeutic agents in experimental *T. cruzi* infections. [Correspondence.]—*Nature, Lond.* 157. 263–264. 685

To test the activity of phenanthridinium compounds on *Trypanosoma cruzi*, an "acme" strain of the organism was established in mice by subinoculation as soon as parasites became abundant in the blood. Phenanthridinium compound, S1544 and the corresponding methane sulphonate, S1577 were found to have a chemotherapeutic action similar to that of Bayer 7602, 13 of 70 treated animals being cured and 18 showing suppression of infection, whilst with Bayer 7602 used in similar dosage seven of 23 animals treated were cured and eight showed suppression. Treatment was more successful in the early stages of infection, the behaviour in this respect differing from that of *T. congolense*.

—U. F. RICHARDSON.

COLLIER, H. O. J., & LOURIE, E. M. (1946.) The action *in vitro* of diamidines and other compounds on *Leishmania donovani*.—*Ann. trop. Med. Parasit.* 40. 88–100. 686

In order to carry out tests of drug action on leishmania at body temperature, unsuccessful attempts were made to acclimatize cultures to a temperature of 37°C. Finally a temperature of 34°C. was used, cultures being maintained in a clear fluid composed of 1 part fresh unheated rabbit serum mixed with 2 parts 12.5% rabbit red blood-cell solution in isotonic saline. The r.b.c. solution was made by taking 1 vol. of blood with 6 vol. of water, adding 1 vol. of 6.3% salt solution, centrifuging it and discarding the deposit. Dilutions of the test drug in this medium were sown with standard suspensions of leishmania, and incubated for 5 days. Drug action at 34°C. proved as much as 20 times greater than at 24°C. A total of 40 compounds, mostly aromatic diamidines, were tested; the only compounds

showing considerable activity *in vitro* were some of the diamidines. Antimonials of known therapeutic efficiency were inactive *in vitro*. Among the diamidines, compounds with an *in vitro* titre of 1:1,000,000 or more were effective *in vivo*, whilst those with lower titres were not. Stilbamidine was found to have a very high *in vitro* activity, and it is suggested that its failure in tests performed by other workers may be attributable to its instability when exposed to daylight, or to its adsorption on agar.

Some degree of parallelism occurred with the findings of ASHLEY *et al.* (1942) as to the trypanocidal activity of the diamidine compounds in respect of *T. equiperdum* infections in mice.

—U. F. RICHARDSON.

CURD, F. H. S., DAVEY, D. G., & ROSE, F. L. (1945.) Studies on synthetic antimalarial drugs. I. Biological methods. II. General chemical considerations. X. Some biguanide derivatives as new types of antimalarial substances with both therapeutic and causal prophylactic activity.—*Ann. trop. Med. Parasit.* 39. 139–156, 157–164 & 208–216. 687

ADAMS, A. R. D., MAEGRAITH, B. G., KING, J. D., TOWNSHEND, R. H., DAVEY, T. H., & HAVARD, R. E. (1945.) Studies on synthetic antimalarial drugs. XIII. Results of a preliminary investigation of the therapeutic action of 4888 (paludrine) on acute attacks of benign tertian malaria.—*Ibid.* 225–231. 688

MAEGRAITH, B. G., ADAMS, A. R. D., KING, J. D., TOWNSHEND, R. H., DAVEY, T. H., & HAVARD, R. E. (1945.) Studies on synthetic antimalarial drugs. XIV. Results of a preliminary investigation of the therapeutic action of 4888 (paludrine) on acute attacks of malignant tertian malaria.—*Ibid.* 232–236. 689

I. Chemotherapy in malaria may be directed against the sporozoite, the tissue phase or the blood phase. Clinical symptoms are associated with the blood phase, and since early attempts at chemotherapy were concerned with the alleviation of symptoms, they were thus aimed at the blood phase. Quinine was formerly the great specific against malaria. When Java was lost and there was a likelihood that quinine would be short and when mepacrine proved to have several disadvantages an intensive search was undertaken for a drug with suppressive as well as causal prophylactic action.

Acute infections of *Plasmodium gallinaceum* in six-day-old chicks were initiated by intravenous inoculation of an approximately standard number of parasitized red cells. Treatment by oral administration through a catheter tube of the drugs to be tested was carried out twice daily until the peak of the parasitaemia curve was

reached. The activity of the substances under test was usually estimated by comparing the density of treated infections with untreated ones at the time of the peak of the parasitaemia curve; the density is expressed as the number of parasitized corpuscles found during the examination of a random sample of 500. The familiar antimalarials and sulphonamides, *e.g.*, sulphanilamide, sulphadiazine, sulphamethazine and sulphathiazole are efficacious in this infection and their activity is easily recognized. Slight activity of a substance can be defined with accuracy by this method of testing, so that pointers to possible practical antimalarial drugs can be discovered by the test. The assay of drugs in this infection, and the concept of a critical dose, *i.e.*, the minimum dose of a substance which exerts what is materially the maximum effect of the drug, are described.

II. When research was begun to find a new synthetic substitute for quinine which had none of the disadvantages of mepacrine, it was decided to break away from the conventional type of quinoline or acridine structure and to investigate some new ring system: for a number of reasons the investigation of derivatives of pyrimidine was undertaken. The prerequisite for antimalarial activity appeared to be the simultaneous association with the pyrimidine nucleus of a basic alkyl amine group and aryl group linked through a grouping capable of prototropic change. Attention was given to another linkage between the aryl group and the pyrimidine nucleus offering similar possibilities of tautomerism, *viz.*, the guanidine group and the compound 3849 (2-*p*-chlorophenylguanidino 4- β -diethylaminoethyl-amino-6-methyl pyrimidine) which was tested against *P. gallinaceum* in chicks; it was also active against *P. vivax*, *P. malariae* and *P. falciparum*. For laboratory biological investigation it was used as the dihydrochloride and initial clinical trials were carried out, using tablets made from this salt. The dihydrochloride can easily be obtained in a crystalline condition and is readily soluble in water. The methods of synthesis of one of these new antimalarials, which has given positive results in the treatment of human malaria, are outlined.

X. The authors attach great importance to the action of two biguanide substances on exo-erythrocytic forms, as they consider that the two major problems in the chemotherapy of malaria, *i.e.*, the discovery of drugs with a causal prophylactic action and with the quality of producing radical cures of benign tertian malaria, rely for their solution on the discovery of drugs with an action on exo-erythrocytic forms. Quinine and mepacrine do not possess these qualities, but "4888" [paludrine] possesses them in such a degree that it was felt that this substance would

go further than any other known substance towards satisfying some of the pressing requirements in the treatment and prevention of malaria. The exo-erythrocytic forms are most refractory to the accepted antimalarials and so offer an explanation as to why radical cures are so difficult to obtain in most malarial infections. Both "4430" and "4888" exert a causal prophylactic action and a therapeutic action against different bird infections, but "4430" is a causal prophylactic only against *P. gallinaceum* and is without action on the blood forms of *P. cathemerium*; no pronounced failure in causal prophylactic action or in therapeutic action has been observed with "4888" in infections by *P. cathemerium*, *P. gallinaceum*, *P. lophurae*, or *P. relictum*. It is concluded that both "4430" and "4888" should be tested for causal prophylactic action and therapeutically with all types of human malaria.

XIII. Paludrine was tested against acute benign tertian malaria in 147 cases. Dosages varied from 10 mg. every 12 hours to 700 mg. every 12 hours for 14 or 28 days. Clinical cure was obtained in every case and no serious side-effects occurred.

XIV. Paludrine was used in the treatment of 22 cases of malignant tertian malaria. Dosages varied from 50 mg. every 12 hours to 600 mg. every 12 hours for 14 days without serious side-effects. Paludrine was found to control the attacks of malignant tertian malaria at all dosages used.

—C. HORTON SMITH.

FREIRE, S. A., & PARAENSE, W. L. (1944.) The prophylactic and curative action of sulfadiazine (2-sulfanilamide-pyrimidine), sulfapyridine (2-sulfanilamide-pyridine), and sulfanilamide (p-amino-benzo-sulfonamide) on the erythro and exo-erythrocytic cycles of "*Plasmodium gallinaceum*" (therapeutic and parasitological aspects).—*Rev. brasil. Biol.* 4. 27-48. [In English: Portuguese summary.] 690

Investigations to determine the relative influence of various drugs on the erythrocytic and exo-erythrocytic cycles of *P. gallinaceum* were made with quinine, atebrian and plasmoquin and sulphadiazine, sulphapyridine and sulphanilamide. Gametogony and schizogony in the two cycles were also studied. Sulphadiazine, sulphapyridine and sulphanilamide were found to be prophylactic for chick malaria as they destroyed the exo-erythrocytic schizonts. The sulphonamides were found to be curative for the exo-erythrocytic forms in malaria induced by inoculation of infected blood or sporozoites. Sulphadiazine was not gametocidal. Sulphanilamide was thought to be responsible for prophylactic and curative antimalarial action on the erythrocytic and exo-erythrocytic

forms. Pyridine and pyrimidine derivatives decrease the toxicity and increase the specific action. Sulphadiazine, sulphapyridine and sulph-anilamide have a greater antimalarial action on erythrocytic than on exo-erythrocytic schizogony and gametogony. The gametocytes have their origin in the haemotropic merozoites of the sexual line, formed in the exo-erythrocytic schizont which completes this cycle without passing through exo-erythrocytic schizogony. The authors believe that the sulphonamides are superior to quinine, atebrian and plasmoquin because of their prophylactic and curative action on the exo-erythrocytic schizonts. Sulphadiazine is the most effective, but for any given dose its prophylactic action is superior to its curative action.—C. HORTON SMITH.

PAGE, A. B. P., STRINGER, A., & BLACKITH, R. E. (1946.) **Investigation of insecticidal sprays.**—*Nature, Lond.* 157. 80–81. 691

The toxicity of emulsion sprays is more difficult to determine than that of oil base sprays. Determinations of pick-up of aqueous sprays and emulsions may be made by inclusion in the spray of aluminium chloride, which, except in high concentration, has no irritant or toxic effect on the sensitive *Aedes aegypti* mosquitoes used as test insects. After treatment the insects are collected and subjected to low-temperature oxidation to eliminate errors known to occur with dyestuffs due to the absorption of tracer. The residual aluminium is then determined colorimetrically by means of the blue lake formed in a buffered solution with haematoxylin. The overall reproducibility using 50–100 adult *Aedes aegypti* is $\pm 3\%$, and as little as 0.002 mg. aluminium can be determined in a final volume of 40 ml. reagents. The authors use this method to study the relationship between pick-up of spray by the insect and spray dosage in ml. per unit volume of air space.—W. M.

PARISH, H. E., & RUDE, C. S. (1945.) **DDT for the control of goat lice.**—*J. econ. Ent.* 38. 612–613. 692

A 0.2% emulsion of D.D.T. made by dissolving it 1:5 in soluble pine oil and subsequently diluting this in soft water killed all three species of goat lice—*Bovicola caprae*, *B. hermsi* and *Linognathus stenopsis*. The fluid retained its potency in an open tank for at least 99 days.

In field tests in Texas, dipping 2,512 Angora goats, shorn or in full fleece, rid them of all lice. Treated goats allowed to mix with infested animals showed only small populations of lice after six months.

No harmful results to the goats were noted and the quality of their mohair was improved.

—T. SPENCE.

SWEETMAN, H. L. (1946.) **DDT to control cat and dog fleas and dog lice.**—*J. econ. Ent.* 39. 417–418. 693

The floors, floor furnishings, furniture and animals' bedding material of some 20 houses infested with *Ctenocephalus felis* were treated by dusting with D.D.T. in powder form. Only light deposits were necessary, and powder-blowers or pepper pots were found to be suitable containers. Concentrations under 5% are not recommended; 10% wettable dust was used most often. The cats and dogs were treated by sprinkling and about 1 teaspoonful was required for a large dog and corresponding doses for smaller animals. No harmful results were noted and one dog and two cats tolerated treatment with 50% dust without apparent harmful effect. The host animal may, however, be driven into a frenzy of scratching caused by the stimulation of the fleas to increased activity. This subsides in a few hours as the fleas are killed. One treatment was adequate for disinfection, but cats allowed access to untreated premises became reinfested in three days indicating a very short residual protection.

One dog was rid of an infestation of lice [species not named] by this treatment.—T. S.

SERGEANT, ED., DONATIEN, A., & PARROT, L. (1945.) **Expériences de protection des animaux domestiques contre la pique des tiques par la poudre insecticide D.D.T. [Tests of D.D.T. as a tick repellent on domestic animals.]**—*Arch. Inst. Pasteur Algér.* 23. 249–259. 694

Application of 24 ml. of 5% D.D.T. solution in kerosene on a dog of 5 kg. weight was insufficient to prevent attachment of *Rhipicephalus sanguineus* introduced into a dog kennel from which ticks could not escape. Application of 180 ml. of the same solution gave good protection for 18 days, during which time only one tick became attached. The ticks that became attached after this time took unusually long to become engorged.

The same solution was applied to the hides of calves in tick-proof stalls into which large numbers of adult *Hyalomma mauritanicum* were introduced. When 200 ml. of the solution were used, ticks introduced on the day of application did not become attached to a treated calf. Ticks introduced seven days later became attached in small numbers, and those introduced 17 days after treatment became attached in large numbers to both the treated and the untreated calves.

In one experiment, ticks infected with *Theileria dispar* were introduced into calf stalls 17 days after the application of D.D.T. The ticks passed on the infection to both treated and untreated calves. Few ticks became attached to the treated calf, while larger numbers became

attached to the untreated calf which died 21 days later from *T. dispar* infection.

The D.D.T. solution was severely irritant to the skins of both dogs and calves, but not to the hands of the operators.—L. DAVIES.

- (1944.) **Preparation and use of dusts, sprays, washes, and dips containing rotenone for the destruction of cattle grubs.** pp. 5. U.S. Department of Agriculture. Typescript. 695

To produce hides free from warble-fly injuries it is necessary to kill all larvae 2–3 months before the animals are slaughtered. This allows time for the injuries to heal, but small scars may be left if the treatment has been inefficient.

The methods of treatment in general use are dusting, spraying, washing and dipping. The method preferred depends upon the weather, the availability of labour and the number of animals to be treated. In all forms of treatment it is essential to use a sufficient amount of material to ensure effective results.

For dusting, rotenone-bearing powders, such as derris or cubé, are more effective when mixed with finely ground tripoli, volcanic ash or pyrophyllite than when mixed with sulphur or talc. At least 3 oz. of the mixture is required to cover the back of an animal and the powder should be worked well into the hair and warble holes by a rotary motion of the fingers. The dust should contain at least 1.5% rotenone.

Sprays should be applied at a pressure of 400 lb. per sq. in. from a trigger-operated spray gun fitted with a no. 5 disk (5/64 in. nozzle opening). The nozzle should be held 12–16 in. above the animal, driving a spray that gives a pattern not more than 5–6 in. in diameter. For spraying at 400 lb. pressure, 7½ lb. derris powder (5% rotenone) per 100 gal. water is effective, but at lower pressures the addition of a wetting agent is essential. Usually ½–1 gal. of the mixture is required for each animal.

Washes should be scrubbed into the hair coat from the shoulder to the hip with a stiff fibre brush. The wash should contain 12 oz. ground derris or cubé (5% rotenone) and 4 oz. granular soap in 1 gal. water.

The dipping method is practicable where large numbers of animals are to be treated. The animals should be held in the dipping vat for 2 min. to ensure thorough wetting. The dipping mixture should contain 10 lb. ground cubé or derris (5% rotenone) and 2 oz. sodium lauryl sulphate in 100 gal. water.

In general, the animals should be treated as soon as the first warble lesions appear and re-treated 2–3 times at intervals of 30 days.—W. M.

GLASGOW, R. D., & COLLINS, D. L. (1946.)

Control of the American dog tick, a vector of Rocky Mountain spotted fever: preliminary tests.—*J. econ. Ent.* 39. 235–240. 696

In south-eastern New York State, Rocky Mountain spotted fever has now become a disease of major importance. Pedestrians in areas infested with the vector tick *Dermacentor variabilis* find it necessary to remove ticks from their clothing at intervals of a few minutes in order to minimize the risk of infection and this prevents, to a large extent, full public use of parks, bathing beaches, etc. During experiments on eradication of ticks by application of acaricides to the herbage, D.D.T., gammexane, rotenone, nicotine alkaloids, pyrethrum, and lethane were used in very small-scale plot tests. D.D.T. and gammexane were promising as ingredients of sprays or fogs but large-scale application was not investigated.—G. B. S. HEATH.

AULT, C. N. (1946.) **Control of *Boophilus australis* in the Argentine by the gamma isomer of hexachlorocyclohexane ('gammexane').** [Correspondence.]—*Nature, Lond.* 157. 699–700. 697

In view of the difficulty of obtaining complete control of *B. australis* (syn. *B. annulatus microplis*) with arsenical dips and the claim that arsenical resistance develops, experiments were carried out on the value of "gammexane". Spraying twice with a fortnight's interval with washes containing 1:1,700, not only freed the animals from ticks but also affected the engorged females, completely preventing oviposition. A similar result was obtained when 1:8,000 "gammexane" was added to a 0.2% arsenious acid dip.—U. F. R.

KIRKWOOD, S., & PHILLIPS, P. H. (1946.) **The antiinositol effect of γ -hexachlorocyclohexane [gammexane].**—*J. biol. Chem.* 163. 251–254. 698

Evidence is presented which shows that γ -hexachlorocyclohexane inhibits the growth of a yeast which requires an exogenous source of inositol. This inhibition was found to be reversible by the addition of *i*-inositol. The data suggest that the spatial configuration of the γ -isomer is similar to that of *i*-inositol and further support the hypothesis that the insecticidal action of the γ -isomer is due to its interference with the inositol metabolism of the insect.—R. ALLCROFT.

DESCHIEUS, R., & LAMY, L. (1945.) **Données expérimentales et pratiques sur les propriétés anthelminthiques de la phénothiazine (thio-diphénylamine), et de ses dérivés. [Tests of the anthelmintic action of phenothiazine and its derivatives.]**—*Bull. Soc. Path. exot.* 38. 288–299. 699

1:500 suspensions in distilled water of phenothiazine, methylphenothiazine, ethylpheno-

thiazine, tetrachlorophenothiazine, methylene blue or thionol all killed the free-living nematode, *Rhabditis macracerca*, in less than 24 hours. The dye thionin in the same concentration was lethal in less than 71 hours.

Mice infested with the oxyurid *Aspicularis tetraptera* were dosed with phenothiazine at the rate of 1.125 g. per kg. body weight per day for eight consecutive days with good anthelmintic effect, but three out of four mice died with symptoms resembling aniline poisoning. After seven days of this treatment, autopsy revealed that although the adult worms had been killed, several larvae were still alive: autopsy after five days' treatment showed many live adults in the gut. One-fifteenth of the above daily dosage administered rectally for nine consecutive days was ineffective. Methylene-blue in a dosage of 0.1 g. per kg. daily for eight days failed to kill *A. tetraptera*: in larger doses it killed the mice before eight days had elapsed. The same dosage of thionin had some anthelmintic action but a higher dosage was lethal to the host. Doses of 0.05–0.1 g. thionol per kg. did not kill the worms. The conclusion is that the therapeutic index approaches unity in this instance and that the drug is therefore unsuitable.

A different result was obtained from rabbits infested with the oxyurid *Passalurus ambiguus*. A dosage of 0.1 g. of phenothiazine per kg. daily for five consecutive days was well tolerated by the host and achieved complete disinfestation. The therapeutic index in this instance is at least 1:10. It is suggested that the active anthelmintic may not be phenothiazine itself but some derivative produced *in situ* by the action of digestive processes. This might account for the somewhat variable response to the drug in human beings, as well as for the different effects obtained in mice and rabbits.

The authors discuss the literature relating to the use of phenothiazine as an anthelmintic in human beings. They conclude that the therapeutic index is about 1:4 and that the drug may be used with care in normal subjects, the recommended dosage being 0.04–0.06 g. per kg. daily for 3–5 consecutive days. In children the therapeutic index rises to 1:2. This leaves an insufficient margin of safety and the use of the drug is not advised.—R. P. HILL.

BATHAM, E. J. (1946.) Testing arecoline hydrobromide as an anthelmintic for hydatid worms in dogs.—*Parasitology*. 37. 185–191. 700

Measures for the prevention of hydatid disease introduced in New Zealand in 1937 involved dosing dogs with arecoline hydrobromide. Due to reluctance and carelessness of

dog-owners, or to the possible ineffectiveness of the method, no significant drop resulted in echinococcosis in lambs. Dog-owners and veterinarians claimed that the drug (1) seriously upset or even killed dogs, (2) failed to purge, or (3) failed to remove worms. These were the main points of B.'s investigation.

Numerous hydatid scolices ("0.5–1.0 ml.") were fed to 157 dogs weighing between 5½ and 62 lb. After 7–10 weeks most of the dogs were given orally a dose of arecoline hydrobromide in water, varying from 1/64 grain to 2 grains per 10 lb. body weight. They were kept under observation, and autopsy was performed on the following day. All faeces and vomit voided between treatment and autopsy was examined for helminths. The remaining dogs were used to test the effect of arecoline given in meat or injected subcutaneously. Hydatid worms were recovered from 146 dogs, of which two-thirds showed over 100 worms while 10 dogs showed over 10,000.

Analysis of the results of oral dosing showed that the smallest dose was unsatisfactory, but that all other dosages gave percentage efficiencies which did not differ significantly and which averaged 95%. However, doses above 1/16 grain per 10 lb. body weight caused a sharp increase in vomiting and discomfort, although no dog died during the experiments. The optimum dosage is thus quite sharply defined.

When arecoline was given in meat—which is easier than giving it in water—the percentage efficiency fell very slightly and a longer time elapsed before purgation. Purgation also occurred when the drug was injected subcutaneously, but no worms were voided. This suggests that the anthelmintic action of arecoline is double; it purges the dog and has a direct effect on the worms. As a purgative it is 90% efficient except at the lowest dosage used.

Experiments on another group of dogs showed that 50% were totally cleared of *Echinococcus* by two doses of arecoline, while with few exceptions all were cleared by three doses. Arecoline also removed other helminths found in dogs, often with an efficiency of 90–100%. However, the efficiency was only 50% against *Toxocara canis*, while *Uncinaria stenocephala* was unaffected except perhaps by the maximum dosage.

In investigations on the direct effect of arecoline on cestodes, single proglottides of *Taenia hydatigena* and *T. pisiformis* were kept at 38°C. in Ringer's solution buffered at pH 7.4 in which, under light tension, the longitudinal muscles kept up a steady pulsation of considerable amplitude. The addition of arecoline (optimum concentration 0.001%) caused each proglottis to undergo prolonged muscular relaxation. The

anthelmintic action of arecoline hydrobromide is attributed to this relaxation, coupled with purgation.—R. P. HILL.

CHARTON, A., & PORTAL, F. (1942.) Le traitement des troubles de la motilité gastro-intestinale du cheval par l'aldéhyde formique. [Use of formaldehyde for the treatment of gastrointestinal derangement in horses.]—*Rec. Méd. vét.* **118**. 218–221. **701**

The intravenous injection of 20 ml. of 10% formalin (made freshly by adding 2 ml. of commercial formalin to 18 ml. of distilled water) was found to be of value in the treatment of cases of equine colic attributable to disturbance of the balance between the vagus and sympathetic control of gut motility. The formalin, by its amphotropic action on these systems, restored the balance, leading to relaxation of sphincters and annular constrictions and promoting peristalsis. The injection was generally followed in a few minutes by an apparent aggravation of the colic symptoms, but recovery followed within 2–3 hours. If necessary, the injection could be repeated 2–3 times at intervals of about an hour. Other drugs should not be given at the time of formalin injection, which should be made scrupulously into the vein.—E. COTCHIN.

TER BORG, H. (1941.) Verwijdering van vreemde voorwerpen uit den oesophagus van het rund door intraveneuze injectie van veratrine. [Removal of obstruction in the oesophagus by means of an intravenous injection of veratrin.]—*Tijdschr. Diergeneesk.* **68**. 985–989. [English, French and German summaries.] [English summary slightly amended.] **702**

Cows, heifers and calves with obstruction of the oesophagus which could not be removed with a sound or Brons loop were given intravenously a solution of veratrin (10 mg. per ml. of alcohol) in doses of 40–50 mg., 25–40 mg. and 10–25 mg. respectively.

Generally the foreign body was regurgitated within a quarter of an hour. If not, the object could usually be pushed with the sound in the direction of the stomach.

SHAW, J. C. (1946.) Studies on ketosis in dairy cattle. VII. The efficacy of B vitamins and methionine in the treatment of ketosis. VIII. Spontaneous recovery.—*J. Dairy Sci.* **29**. 131–139 & 151–155. [For part VI, see *V. B.* **15**. 400.] **703**

VII. Thiamine hydrochloride when given alone either orally or intravenously or with other B vitamins (nicotinic acid, calcium pantothenate, riboflavin, pyridoxine, *p*-aminobenzoic acid, inositol, choline and biotin) was not effective in the

treatment of seven dairy cows with uncomplicated ketosis, nor did any of these compounds appear to increase the efficacy of glucose therapy. Methionine was also ineffective whether given *per os* or intravenously.

VIII. Data are reported for several field cases of ketosis in which the animals recovered without treatment. Evidence of recovery was based on the return of blood glucose and blood acetone bodies to normal levels, together with disappearance of symptoms.

It is pointed out that since some cows recover spontaneously, there is need for caution in evaluating the efficacy of various substances in the treatment of the disease.—R. ALLCROFT.

JENSEN, E. (1941.) Phenylmercuric ointments. —*Acta path. microbiol. scand.* **18**. 400–411. [In English.] **704**

Studies were made to determine the extent to which phenylmercuric acetate and chloride made up into ointments would diffuse into an agar plate. The acetate is much more soluble than the chloride in water, mineral oil and olive oil. Sterile agar plates were poured with a small glass cylinder placed centrally on the plate; the cylinder was then removed aseptically and the space filled with the ointment under test. The plates were inoculated with a culture of *Staphylococcus aureus* and incubated for 36 hours. The effectiveness of the ointment containing the phenyl mercuric compound under test, either the chloride or the acetate, made up with a number of different bases of varying concentrations, was assessed by photographing the plate and measuring the width of the clear sterile zone surrounding the cylinder of ointment.

The results showed that ointments made up with phenylmercuric chloride or the acetate were both bactericidal. The nature of the base did not appear greatly to affect the issue, although the diffusibility of the phenyl mercuric salts from "opa" cream and vaseline was greater than from other bases. The chloride, triturated with the same unguentary substance, seemed to be just as effective as a solution of the acetate made up in equal concentrations, but the actual amount of the acetate or chloride was of relatively little importance as far as the diffusibility of the salt from the ointment was concerned.—A. EDEN.

QUISNO, R., & FOTER, M. J. (1946.) Cetyl pyridinium chloride. I. Germicidal properties.—*J. Bact.* **52**. 111–117. [Authors' summary slightly amended.] **705**

Cetyl pyridinium chloride is germicidal in high dilutions against a variety of gram-positive and gram-negative bacteria, certain common pathogenic fungi, and the flagellate, *Trichomonas*

vaginalis, under acid as well as alkaline conditions, at room temperature as well as at 37°C. and in the presence of animal serum. The nontoxic

See also absts. 512 (gramicidin), 565 (treatment of coccidiosis), 626 (of bronchitis), 642 (of swine enteritis), 655 (of anasarca), 674-676 (sulphonamides).

character of the compound and its bactericidal properties under diverse conditions make it an exceptionally versatile and valuable disinfectant.

HYGIENE, PUBLIC HEALTH AND VETERINARY SERVICES

CRAIGE, J. E. (1946.) Significance of concentration of coliform organisms in raw milk upon survival of pasteurization.—*J. Milk Technol.* 9. 191-196. [Author's summary and conclusions copied *verbatim*.] 706

Eight strains each of *Escherichia*, intermediate and *Aerobacter* coliform organisms isolated from raw milk, pasteurized milk and ice cream were all demonstrated to be able to survive 62°C. for 30 minutes in milk when present in sufficient number. No strain tested survived when the concentration before pasteurization was less than 700 per ml.

It is recommended that pasteurized milk should not be considered satisfactory for human consumption if it is positive for coliform organisms in more than two of five 1 ml. samples.

When gross or persistent coliform contamination occurs, one of the following conditions is probably involved: (a) contamination after pasteurization, (b) inadequate pasteurization, (c) improper handling of the milk after pasteurization, (d) excessive numbers of coliform organisms in raw milk, (e) heat resistant strains.

The routine use of the phosphatase test and the standard plate count in conjunction with the coliform test and the use, when indicated, of special tests including coliform counts and laboratory pasteurization of raw milk, and the examination of line samples, taken at the plant, may help to determine the specific cause of contaminations that prove difficult to control.

MÜSSEMEIER. (1942.) Zur Frage der Milcherhitzung in Sammelmolkereien. [Heat treatment of milk in dairies where milk is pooled.]—*Z. InfektKr. Haustiere.* 59. 5-15. 707

In spite of heat treatment and other hygienic measures, outbreaks of disease often follow the use of milk from dairies where large quantities are pooled. The delivery of sour and unclean milk from individual farms appears to be the chief cause of this, and M. recommends that only the morning milk should be delivered to the dairy each day, the evening milk being separated and the cream only sent to the dairy with the next morning's milk. In this way, only fresh milk would be sent for heat treatment, and skim milk would be available for feeding calves on the farm in a much fresher state than is usually the case.

—ANN F. RUSSELL,

SCHWEIGHÄUSER, F. (1943.) Der Begriff der Untauglichkeit des Fleisches zum Genuss für Menschen. [When meat is unfit for human consumption.]—*Z. Fleisch- u. Milchhyg.* 53. 96-97. 708

On January 2nd, 1940, the State Court revised the decision of an inferior court which had punished a butcher because he had not told the inspector of the Meat-Control Station that a slaughtered ox had been ill, and had been under veterinary treatment. Cooked, the meat had shown signs of being tainted, and the single partaker had become sick.

The inferior court had based its decision on the law against the sale of "meat injurious to human health", and "unfit for human consumption".

In the Court of Appeal it was held that:

(A) "Unfit for human consumption" is the more comprehensive term as against "meat likely to injure human health," for it includes also tainted meat.—In legal decisions it is of no consequence whether the tainting was caused by the illness of the animal, or by the veterinary treatment.

(B) The fact that nobody was actually harmed is no legal proof of the fitness of the meat for consumption.

(C) It is not legally sufficient to base any decision on the possibility that the meat of an animal suffering from certain diseases and treated in a certain way will alter in such a manner as to become "unfit".

(D) An inspector is punishable if he wittingly passes unfit meat as fit for consumption, as is anybody who withholds evidence which might have led to a different judgment.

(E) The case is more serious if such deception can be proved to have been practised to profit the person concerned.

(F) The stamp-mark denotes only the fact that the inspector has tested and passed the meat. Public opinion, however, regards it as a warrant of fitness.—G. HUEHNS.

LIMONT, A. G. (1945.) R.A.V.C. livestock depots.—*J. R. Army vet. Cps.* 17. 19-21. 709

The four depots attached to the Middle East Forces supplied fresh meat superior to that obtained locally, for the British Army and Indian

and native troops and provided a reserve of meat on the hoof to meet contingencies.

Each depot could function independently but in practice No. 1 depot in Aleppo bought the livestock required, graded it and vaccinated against anthrax; then, after a resting period, livestock were sent to other depots or R.A.S.C. field butcheries. No. 2 depot at Homs received most of its livestock from Aleppo for fattening as soon as possible. Any disease was eradicated and animals were then issued to local supply units or direct to Indian formations. No. 3 depot in Palestine was on a smaller scale and its function was to retain a reserve of beef and mutton on the hoof in case refrigerator accommodation broke down. It also bred calves and lambs for consumption in adjoining hospitals. No. 4 depot had the duty of escorting thousands of sheep from Egypt to the Central Mediterranean Forces. Each depot was staffed by one officer and 15 British personnel of the R.A.V.C. Civilian labour was engaged as required on the scale of one native to 20 cattle or 100 sheep.

Cattle, sheep and goats trekked into Aleppo from all over Syria, Turkey, Iraq and Persia, that city having been the centre of a great trade for countless generations. Cattle purchased were of three types, Syrian, Turkish or Iraqui. The percentage rejected was high. Sheep purchased were of many types; outstanding were the Awas, Agra, Hurok, Nedj, Gerha and especially the fat-tailed Homra.

Forage for livestock was provided by R.A.S.C. installations. Hay and green forage were grown on land belonging to the War Department in the Homs and Transjordan areas. Carob bean was imported from Cyprus and cottonseed and linseed cake from Egypt. Cattle received 6 lb. concentrates and 14 lb. dry matter: concentrates included 2 lb. barley, 2 lb. carob bean and 2 lb. cottonseed cake. Dry matter consisted of tiben [chopped wheat straw], barley, wheat straw and local hay up to 3 lb. per head if available, and 2 oz. salt per head daily. Sheep received three-fifths of the cattle scale. Adjustments were made according to the size for varying types. Water was laid on in concrete troughs.

Tick diseases were controlled by dipping. Anthrax constituted the most serious problem but was kept under control by vaccination with anthrax attenuated spore vaccine, 0.125 ml. being given intradermally to all animals when purchased. Each animal purchased was examined and passed by the veterinary officer of the Purchasing Commission.

The main causes of rejection were debility, sheep scab, sarcoptic mange in sheep, sheep or goat pox, myiasis, distomiasis, parasitic broncho-

pneumonia in sheep, acute pleuro-pneumonia, *Oestrus ovis* infection (nasal catarrh), piroplasmosis, anthrax (if deaths had occurred in a flock) and gross warble infestation.—J. A. GRIFFITHS.

HAUSER, G. H., TREUTING, W. L., & BREIFFELH, L. A. (1945.) **An outbreak of food poisoning due to a new etiological agent—*Salmonella berta*.**—*Publ. Hlth Rep., Wash.* 60. 1138–1142. 710

The authors record an outbreak of food poisoning among 14 people which resulted from the consumption of pork sausage meat contaminated with *S. berta*. Only two cases required hospital treatment and there were no deaths.

—A. BUXTON.

WATT, J. (1945.) **An outbreak of *Salmonella* infection in man from infected chicken eggs.**—*Publ. Hlth Rep., Wash.* 60. 835–839. 711

W. describes an outbreak of acute food poisoning caused by *S. montevideo* among the crew of a ship. The origin of infection was found to be uncooked chicken eggs which were incorporated in an egg mayonnaise.—A. BUXTON.

GRAY, D. F. (1946.) **A review of the veterinary aspects of bacterial food poisoning in man.**—*Aust. vet. J.* 22. 55–63. 712

G. reviews present knowledge regarding food poisoning in man due to infections, toxins and *Clostridium botulinum* and correlates it with animal diseases, discussing the responsibilities of veterinarians, who have control over animal products intended for human consumption. A list of control measures to prevent food poisoning in man is given and some reasons are suggested for the supposed lower incidence of food poisoning in Australia than in other countries.—D. C. BLOOD.

McCLUNG, L. S. (1945.) **Human food poisoning due to growth of *Clostridium perfringens* (*C. welchii*) in freshly cooked chicken: preliminary note.**—*J. Bact.* 50. 229–231. 713

The author believes this to be the first report of human food poisoning caused by *Cl. welchii*. In the outbreaks investigated, 20 persons were involved, with symptoms of nausea, abdominal pains and diarrhoea and a volunteer who consumed a sample known to be contaminated also had typical symptoms; all the persons affected recovered in 24–48 hours. They had eaten food prepared from chicken, cooked by steam under low pressure one day and eaten the next. Some samples of suspected chicken broth had gas bubbles and all samples were found to be heavily contaminated by Gram-positive rods with the cultural reactions of *Cl. welchii*. The strains of *Cl. welchii* isolated have not been typed, as culture filtrates were not toxic for mice or guinea pigs.—D. W. MENZIES.

TECHNIQUE AND APPARATUS

ANDRESEN, P. H. (1945.) Theoretical and practical results from employment of indigo carmine in studies on anaerobic bacteria.—*Acta path. microbiol. scand.* 22. 165-167. [In English.] 714

Indigo carmine is recommended as an easily obtainable and inexpensive substitute for cysteine in media used for culturing anaerobes. It was found that when incorporated in broth or in semi-solid medium, the indigo carmine did not seriously inhibit the growth of certain of the common clostridia, but enhanced their growth by removing oxygen from the medium. A medium consisting of semi-solid peptone agar plus 0.5% glucose and 0.1% indigo carmine was used.—J. KEPPIE.

STUMPF, P. K., GREEN, D. E., & SMITH, F. W., Jr. (1946.) Ultrasonic disintegration as a method of extracting bacterial enzymes.—*J. Bact.* 51. 487-493. [Authors' summary slightly amended.] 715

A method of disintegrating bacterial cells by ultrasonic radiation is described. The method has been employed to prepare cell-free enzyme extracts of bacteria. Factors which influence the degree of efficiency of ultrasonic disintegration are discussed.

UMBERGER, E. J. (1946.) A laboratory holder for immobilizing experimental rats.—*J. Lab. clin. Med.* 31. 369-371. 716

U. describes an apparatus for immobilizing rats used in pharmacological studies on ointments, which is constructed from two squares of sole leather, $\frac{3}{8}$ in. thick. In the centre of each square holes are cut large enough to accommodate respectively the hips and neck of the animal. The leather above the holes is severed by a vertical cut so that the neck or hips may be easily inserted. A lock consisting of a bar of tin, hinged to one side and secured by a brass bolt on the other secures the cut leather after the animal has been placed in the hole. Two brass rods separate the stocks, which are placed vertically on a wire mesh floor, and the distance between them is adjusted by means of nuts on the rods.

Before being placed in the stocks the animal is anaesthetized and the flexible leather stocks are bent aside to allow the entrance of the neck and hips. The locks are closed and fastened and the holder is secured to the wire mesh bottom by steel wire hooks. Food and water can be supplied in the usual way. Animals were confined in this manner for 1-24 hours with a maximum of 72 hours. When confined for 72 hours they were somewhat ill at ease and lost some weight, but recovery was rapid and complete.—T. E. GIBSON.

CARMICHAEL, E. B., MCBURNEY, R., & CASON, L. R. (1946.) A trap with holder for handling vicious laboratory animals such as wild rats.—*J. Lab. clin. Med.* 31. 365-368. 717

The apparatus consists of a cylindrical holder into the end of which fits a truncated cone-shaped trap, just large enough to hold the animal. The apparatus is made of "hardware cloth" [a type of wire netting] and two comb-like stops which are inserted through the sides are used to immobilize the animal. Round the base of the holder is a square of sheet iron which can be fastened against the door of the cage. The animal is induced, by blowing, to enter first the holder and then the trap, where it is held in position by the stops. The apparatus is placed on end and the animal is available for whatever operation is necessary.—T. E. GIBSON.

HANSEN, L. T. (1944.) Om oppdrett av mus i vitenskapelig forsøksøyemed. [The rearing of mice for scientific research purposes.]—*Norsk VetTidsskr.* 56. 160-173. 718

H. describes in detail the rearing of mice for use in scientific research, with emphasis on hygienic housing and lighting. There must be regular access to daylight, with the provision of dark compartments. Exposure to direct sunlight is to be avoided. Mice thrive at a temperature of 20-21°C. A suitable basic diet consists of bread, whole milk and whole millet and water daily. Every second day gruel made of 5% fish meal, 5% herring meal, 3% cod liver meal, 5% flax meal, 12% soya bean meal, 10% cocoanut, 25% maize meal, 25% rye or wheat, 10% seaweed meal and salt is added. Dandelion leaves or other suitable green food in summer and kohl rabi and turnip in winter should also be given every second day. A piece of dried fish, which has a high nutritive value, should be added occasionally for gnawing. Mice should be fed once a day. Suggested quantities of food adequate for 50 adult mice are: 150 g. bread, 200 ml. milk, 200 g. millet, 200 g. gruel or fish, water. Mothers with young need extra food, especially milk. Cooked herring, cod, etc., may be given instead of gruel.

A small initial stock should be very carefully selected. Two or three mothers may be placed in the same box if their young are born on approximately the same date. Mothers feed the young for 20-25 days. If the young are to be used for breeding, they are left with the mothers for 30-35 days. If to be used for experimental injections they are weaned at 18 days. At two months they are sexually mature and the females can be used for breeding until they are about a year old. One male with ten females is kept in each

breeding box. The young, when removed from the mothers, are segregated according to sex, 100-150 to a box. The utmost importance of cleanliness is emphasized.—M. E. ROBERTSON.

SCOTT, D. B., & WYCKOFF, R. W. G. (1946.) **Shadowed replicas of tooth surfaces.**—*Publ. Hlth Rep., Wash.* 61. 697-700. [Authors' summary copied *verbatim*.] 719

Metal-shadowed collodion replicas can be prepared which reveal the microstructure of the surfaces of teeth *in situ* as well as of extracted teeth. Typical micrographs are presented which show the appearance under the optical microscope of the surfaces of unbroken and of severely etched enamel, of areas of disintegration and probable incipient caries and of pits caused by excessive amounts of fluorine in drinking water. This experimental technique thus offers a new means of approaching such important dental problems as the changes in tooth surfaces (associated with dental caries attack), and the alteration in structure resulting from the administration of different amounts of fluorine.

NEUMANN-KLEINPAUL, K. (1944.) Die endoskopische Photographie bei grossen Haustieren. [Endoscopic photography in the larger domestic animals.]—*Arch. wiss. prakt. Tierheilk.* 79. 172-175. 720

Examples are given of the use of laryngeal photography in diagnosis in horses; it is concluded that the method has certain advantages over laryngoscopic technique, especially if colour photography can be successfully introduced.—R. MARSHALL.

COTTIER, R. (1943.) Ein Refraktometer für Tieraugen. [A refractometer for animal eyes.]—*Arch. wiss. prakt. Tierheilk.* 78. 395-413. 721

C. discusses the inadequacies of existing ophthalmoscopes for use on animals and describes a new instrument for examining the interior of the eye and for the estimation of the natural refraction of the lens. The instrument is self-contained with its own source of light and can easily be used for animals in the standing position. C. examined over 400 animals and found that 56% of the horses tested had normal refraction (emmetropic), 23% were slightly myopic, 14% definitely myopic, 2% hypermetropic and 5% anisometropic. Of mules 75% were emmetropic, 21% slightly or definitely myopic and 4% anisometropic. Of the cows, 33% were emmetropic, 25% slightly myopic, 32% definitely myopic and 3% anisometropic and 7% had astigmatism. Four out of seven goats were emmetropic, two myopic and one hypermetropic. Four out of six dogs were emmetropic, one was myopic and one hypermetropic.

C. formed the impression that in farm animals powers of accommodation are slight. Special attention was paid to horses which were prone to shy; of 17 of these, five were emmetropic, three had unspecified eye disease and nine were myopic. C. suggests that horses might be rendered temporarily myopic by attaching lenses over the eyes and might then be tested for any shying tendency, etc.—J. E.

WEISSBERG, J. L. (1945.) **Evaluation of bone-continuity by sound conduction.**—*Bull. U.S. Army med. Dep.* 4. 471-474. 722

A method for diagnosing fractures of long bones by sound conduction readings is described. A tuning fork which has been struck is held over a bony prominence distal to the fracture while auscultating with a stethoscope over a bony prominence proximal to the fracture. The sound thus transmitted is compared in intensity with the sound transmitted between the same two points on the uninjured limb. The method is claimed to be a valuable aid because of its simplicity and rapidity as well as its applicability when the X-ray may not be available. Details are given regarding the intensity or absence of sound associated with various types of fracture. The method is also of value in determining the progress of healing. Such a method might prove to be of value in veterinary surgery.—M. C.

MCCULLOUGH, E. C. (1946.) **The role of disinfection in veterinary medicine. I. Sterilization of surgical instruments.**—*J. Amer. vet. med. Ass.* 108. 242-249. 723

Details are given of an experiment to ascertain the minimum time and temperature required for sterilization by dry heat in an electric oven. Screw-capped bottles were contaminated by rinsing with cultures of thermophilic organisms and the mixed faeces of various animals and contaminated tissues and debris from septic wounds. The bottles were air-dried and then wrapped in flour sacking and paper, which would give more protection against heating than likely under normal conditions of surgical sterilization. The bottles were subjected to bacteriological examination after various periods of heating at various temperatures. Heating overnight at 127°C. was sufficient to secure complete sterilization. By comparison with the results of MURRAY & HEADLEE (1931), who experimented with tetanus spores, the author concludes that in "veterinary practice" exposure overnight in a hot oven at 140°-143°C. affords a reasonable margin of safety where the degree of contamination is not excessive. This temperature does not draw the temper from cutting instruments.—H. S. McTAGGART.

MISCELLANEOUS

BASSLER, C. E. (1946.) **The effects of lightning on livestock.**—*Iowa Vet.* 17. No. 2. 20–21 & 34. 724

This article includes discussion on deaths by lightning recorded from Great Britain during 1927–33 and an account of B.'s own experience. History, symptoms and lesions are briefly discussed. Owners seldom suggested that lightning had caused death unless the animals were insured and B. considers that at least 90% of alleged cases were not genuine. At least 90% of cases of lightning stroke are said to show burned or scorched hair. Among other points mentioned are its differential diagnosis (from anthrax, plant poisoning, lead poisoning), the early transient rigor mortis which disappears within 12 hours, petechial haemorrhages, and blindness or nystagmus in animals which survive.—E. G. WHITE.

CARTWRIGHT, B. W. (1944.) **The "crash" decline in sharp-tailed grouse and Hungarian partridge in Western Canada and the role of the predator.**—*Proc. 9th N. Amer. Wildl. Conf.*, 1944. pp. 324–330. 725

Populations of sharp-tailed grouse and Hungarian partridge had been at their peak numbers for several years before a "crash" decline reduced their numbers in a single season.

Meteorological observations for the years of the decline (1942–43) revealed that during the critical hatching period temperatures had been below normal and rainfall above normal. In scattered districts conditions were more normal and increases were noted in the populations of both species. Young gallinaceous birds are highly vulnerable to cold wet weather during the first ten days of life. The possibilities of disease as a cause of the decline were eliminated.

Upland game birds and water fowl do not produce two broods in one season but the majority will reneest if they lose their unhatched eggs. It is evident that a species with a three-year life span which produces all its young uniformly in June would become extinct if three successive adverse seasons destroyed the hatch. Predators, by destroying a substantial proportion of the first and second nestings, stagger the nesting attempts and thus become a major factor in furthering survival of game birds. Predation must however be substantial to be effective. According to C., observation indicates that absence of predators and consequent uniformity of nesting period might be so disastrous that upland game species would become extinct. Over-numerous predators would produce the same result as a total absence of predators and therefore reasonable control of predators should give good results. Heaviest

losses to young waterfowl come about as a consequence of the drying-up of surface waters before they can fly; staggered nesting attempts are therefore likely to aggravate such losses. There is no evidence that even moderate predation is beneficial to waterfowl and therefore the principal egg-predators should be controlled when predation is known to be excessive.—C. HORTON SMITH.

CONTE, A., & PLEINDOUX, A. (1945.) *La profession vétérinaire et sa législation.* [The veterinary profession and its laws.] pp. 527. Cavaillon: Imprimerie Mistral. 8vo. Fr. 200. 726

There is no book published in Great Britain that can in any way compare with this, which can best be described as the French veterinarian's *vade mecum* of professional life from the cradle to the grave, dealing as it does with the legal and ethical aspects of his career from the time he enters college to the very end of his life: it even describes what a practitioner's neighbours should do to safeguard the interests of his widow or heirs. The British reader's first reaction on reading the book is that notwithstanding the increasing legislation in this country, we are not as yet bound by regulations to anything like the same extent as our French colleagues.

The work is divided into seven chapters, the first dealing with the system of training in the three French Veterinary Schools of Alfort, Lyon and Toulouse, which are all government institutions. Elaborate details are given of what a student can and cannot do, from the kit he must take to college, where he must live, which depends upon his age and even on his parentage, to the smallest details of his college life. In passing it may be mentioned that the Principals of each of these schools have the right of direct access to the Minister (of Agriculture).

The second chapter concerns the status of the profession from the earliest days of veterinary teaching in the 18th century to the Act of 1923 which so improved the standing as to entitle the holders of the diploma who have defended a thesis before the Faculty of Medicine, Paris, Lyons and Toulouse to the designation of "Docteur-Vétérinaire". Severe penalties are laid down for unqualified persons convicted of using this title without authority.

Chapter III describes the government and discipline of the profession. In France there are two governing bodies, one a higher committee, the "Conseil Supérieur de l'Ordre", for the country generally, which sits in Paris, and local or regional committees "Conseil de l'Ordre régional" appointed in the different districts. The President and Vice-President of the Conseil

Superieur d l'Orde are appointed by ministerial decree, while its members, 12 in number, are elected by secret ballot. The Conseil de l'Orde régional are each composed of 12 members nominated by the Secretary of State for Agriculture on the recommendation of the Conseil Superieur de l'Orde. Each of these committees appoints a council of discipline, possessed with plenary powers to deal with their members accused of unprofessional conduct, although the accused has the right of appeal against the verdict to the Council of Discipline of the Conseil Superieur de l'Orde which is composed of six of its members. Strangely enough these committees have no jurisdiction over members of the profession in government or municipal employment, nor do they even hear accusations against practitioners if the complaint refers to irregularities connected with part time official duties, as the employing authority is responsible for dealing with all such complaints. Before setting up in practice each member must fill in a most comprehensive questionnaire giving details about himself and his family in order to have his name placed on the roll of practitioners for the district. Should a veterinarian's name be refused for this roll he has the right to appeal to the Conseil de l'Orde régional. Each roll is renewed and brought up to date annually and a veterinary surgeon moving to another district must see that his name is duly inscribed on the roll for the new district to which he goes.

Chapter IV is by far the longest and consists of no fewer than 133 pages of this closely printed work. It deals exhaustively with the history of the profession on its fight for a full professional recognition which it only obtained by the Act of June 17th, 1938, amended as late as 1942. This chapter is most interesting, going into the ethics of the profession, the fees allowable, methods of claiming fees, the position of *locum tenens*, both qualified and students, and so on. By this 1938 Act quackery seems virtually to have been eliminated, but owners are allowed to treat their own animals, farriers to treat diseases of the foot, and the castration of animals, other than of equines, may be carried out by unqualified persons and so also may first aid treatment. There are, however, great difficulties in defining such treatment.

Chapter V concerns the treatment of animals affected, or suspected to be affected, with contagious disease. The book does not give the Regulations or Orders to be enforced for their prevention and control as are to be found in the "Handbook of Acts and Orders relating to Diseases of Animals" as is published by the Ministry of Agriculture and Fisheries in Great Britain. The use of biological products such as

tuberculin, mallein, vaccines, sera, etc., is, however, included, and the position of the profession regarding the dispensing of drugs, the keeping of pharmacies and the use of poisonous preparations are dealt with at some length.

The last chapter is connected with the medico-legal aspects of the profession, the professional responsibility towards brother members, the public, the law, the police and claims for damages against individual members for alleged neglect or mal-practices.

Throughout the book numerous legal and other opinions are quoted and extracts given of law cases cited in explanation of some of the ordinances. The work ends with an addendum to chapters III and IV, three pages of errata and an index to the subject matter of the various chapters. All interested in the legal and ethical aspects of professional life as it affects our professional brothers should read this volume which can give many useful hints regarding professional etiquette.—D. S. RABAGLIATI.

*GRZIMEK, B. (1944.) Gedächtnisversuche mit Elefanten. [Memory tests on elephants.].—Z. Tierpsychol. 6. 127. [Abst. from abst. in Dtsch. tierärztl. Wschr./Tierärztl. Rdsch. 52/50. 278.] 727

Experiments were carried out to assess the memory powers of elephants. After appropriate training they were required to take food placed in one of five chests, in full view of the elephants. When the elephants were released 6 m. away from the chest immediately the food was placed in it, up to 76% correct selections were obtained, rewards being given for correct and regular punishment for incorrect choices. Satisfactory results were obtained from the best member of the team up to 15 sec. after the bait was put into the chest. Another experiment showed a memory time of 45 sec. at a range of vision of 2 m. After an interval of two hours and occasionally after 1-2 days the elephants would still search for the food which was placed in the accustomed position. It is concluded that elephants have far shorter memories than wolves and dogs for procedures connected with the finding of food.—C. H. S.

ULLRICH, K. (1944.) Ein Nachwort zur Geschichte des Tierärztlichen Instituts der Universität Prag. [The Veterinary Institute of Prague University.].—Dtsch. tierärztl. Wschr./Tierärztl. Rdsch. 52/50. 315. 728

In 1944, the Veterinary Institute of Prague University was reopened, with PROF. HOFFERBER as Director. U. describes the circumstance under which it was closed in 1932.—G. HUEHNS.

KNEŽEVIĆ, M. (1945.) Razplodnja izoliranih Limnea stagnalis L. [The reproduction of

isolated individuals of *Lymnaea stagnalis*.]—*Vet. Archiv.* 15. 47–52. [Abst. from German summary.] 729

Autogamous reproduction in isolated hermaphrodite snails is a recognized phenomenon, yet opinion varies as to whether or not self-fertilization occurs.

In this study, 50 snails were observed six hours a day for 150 days. In no case was self-fertilization observed, although egg production was normal. In two snails the male fertilizing organ was removed. One of these produced four egg masses; and the other died next day, after depositing one egg mass. In both cases the eggs developed into normal snails.

K. concludes that self-fertilization is unnecessary for autogamous reproduction.

BRUMPT, E. (1946.) Elevage et alimentation des cobayes au centre de Richelieu (Indre et Loire). [The breeding and feeding of g. pigs in Indre et Loire (France).]—*Ann. Parasit. hum. comp.* 21. 89–92. 730

The housing, management and feeding of a breeding stock of g. pigs are described. Attempts by selective breeding to produce a more prolific strain have been unsuccessful and the output per adult female averages about six progeny a year. So long as the g. pigs are adequately fed, infectious disease is not an important cause of mortality. The effects of inadequate diet during the war years have been shown by a serious decrease in production. For breeding, 12 females are housed with one male. A breeding stock of 800 females and 80 males is maintained.—M. C.

REPORTS

CHINA: SZECHWAN PROVINCE. (1942.) [Work on animal husbandry and veterinary medicine in 1941.] [HSIUNG, T. S.]—*J. Szechwan agric. Res. Sta.* 4. No. 6, 7 & 8. 3–20. 731

Several experiments were conducted on animal feeding and breeding. It was found that peanut cake, by virtue of its palatability and high content of essential amino acids, was far better than rape-seed cake as a protein supplement for feeding pigs. The daily increase of body weight in pigs fed with peanut cake was 0.404 kg. and that of those fed with rape-seed cake was 0.302 kg. It was demonstrated that a selected boar had better offspring in both number and percentage weaned than the average animal kept by poor people without any attention and which was often used for service at a very early age. The average egg yield per year of the native hens was 90. The report states that this was mainly due to extraordinarily high frequency of broodiness, which occurred 4–10 times a year.

In a grading experiment with the native rabbit and the Angora rabbit, long hair was found to be a recessive character and short hair a dominant one. The ratio of the short-haired offspring to

the long haired was found to decrease from 1.12 : 1.0 of the F_2 to 0.96 : 1.0 of the F_4 .

Farmers were encouraged to feed white pigs, because of their economic importance, the white bristle still being one of the most important exports of the Province.

The second part of the report details the amount of sera and vaccines produced by the two serum plants in 1941 as follows:—ANTHRAX antiserum, 189,204 ml.; SWINE ERYSIPELAS antiserum, 371,193 ml.; RINDERPEST antiserum, 1,262,779 ml.; PASTEURELLA INFECTION antiserum, 174,414 ml.; SWINE FEVER antiserum, 60,724 ml.; SWINE ERYSIPELAS vaccine, 51,280 ml.; ANTHRAX spore vaccine, 5,080 ml.; FOWL CHOLERA vaccine, 2,100 ml.; RINDERPEST organo-vaccine, 149,635 ml.

The third part of the report gives the number of cattle and pigs vaccinated during 1941 as:—RINDERPEST, 11,241; SWINE FEVER, 11,999; SWINE ERYSIPELAS, 11,641. It was estimated 200,000 draft cattle and 2,600,000 pigs were lost every year from rinderpest and swine fever respectively.—S. J. CHU.

BOOK REVIEWS

THIEULIN, G., & VUILLAUME, R. (1942.) Éléments pratiques d'analyse et d'inspection du lait. [Practical fundamentals of milk testing and inspection.] pp. 206. 34 figs. Paris: Le Lait "de Ch. Porcher". Revue générales des questions laitières. 8vo. 732

This volume comprises a detailed description of laboratory methods for the examination of

milk, covering its physical, chemical, bacteriological and biochemical examinations at all stages.

There are three chapters; the first dealing with the classification of milk into normal, treated, damaged and abnormal categories. The second chapter is the largest and describes the methods used in examinations, including biological and serological examination. The third chapter sum-

marizes the results and indicates the interpretation to be placed on the various analyses, both at the distributing centres and in the laboratories.

The appendices include an inventory of the equipment necessary for a milk laboratory, a list of the official orders for milk inspection in France and an excellent alphabetical index. The work is well printed and, in addition to the 34 figures, includes three plates, one of which is coloured. The book can be recommended as a useful addition to the library of all dairy laboratories.

—D. S. RABAGLIATI.

ANON. (1945.) Guide de l'inspecteur des viandes. [The meat inspector's guide.] pp. viii + 209. 96 figs., 1 plate. Berne: Office Vétérinaire Fédéral. 8vo. 733

This work was first published in 1909, but was rewritten and brought up to date when the meat regulations for Switzerland were revised in 1938–39 by Federal Regulation dated August 26th, 1938. It should be read alongside the new regulations to which frequent reference is made. These regulations allocate the supervision of meat inspection in Switzerland to the Federal Veterinary Service, whose duty it is to enforce unity of control. The book is really prepared for the lay meat inspector, to whom it must prove invaluable.

As would be expected, the inspection of horse flesh is given considerable prominence. Wherever possible, the non-veterinary meat inspector called to examine the carcass of a horse, ass or mule must seek the advice of a veterinary inspector before passing judgment; this he must also do if he finds any serious illness in an animal before slaughter and in all cases of emergency slaughter.

The book gives an excellent description of the anatomy of the food animals, illustrated by diagrams and numerous figures clearly reproduced: the diagrammatic representation of the blood circulation and that of the lymphatic nodular system are exceptionally clear and lucid. Great stress is placed on the *ante-mortem* examination of animals for slaughter and a regular system to be adopted is suggested. The methods of slaughter are detailed and a careful routine is laid down for the examination of the carcass, indicating the abnormalities met with in the different animals. A special feature is a short practical summary of how to detect the substitution of one flesh for another, such as horse flesh for beef, goat for mutton, or even cat for rabbit.

A description of the notifiable contagious diseases in Switzerland is included, with descriptions of each condition and details of treatment. These include rinderpest, bovine contagious pleuro-pneumonia, foot and mouth disease,

glanders, anthrax, blackleg rabies, swine erysipelas, swine fever, pneumo-enteritis of the pig and contagious agalactiae of the sheep and goat.

The parasitic conditions are dealt with according to their transmissibility or otherwise to man and the pathological conditions produced by them are indicated. In the case of TB., affected carcasses are classified as fit for human consumption, fit under certain circumstances, or totally unfit. In the case of the first two classes all affected organs and their glands must be removed. Meat fit only conditionally must be labelled so that it will not be eaten without prolonged cooking.

The book is produced on good paper and is clearly printed. For its clarity of description it is to be recommended to anyone interested in meat inspection, whether he be in Switzerland or not.

—D. S. RABAGLIATI.

TOBBACK, L. [Docteur en Médecine Vétérinaire, Attaché au Ministère des Colonies]. (1946.) L'inspection des viandes au Congo Belge. [Meat inspection in the Belgian Congo.] pp. 88. 8 figs. Brussels: Imprimerie A. Beirnaert. 8vo. 734

This is a short and concise treatise on meat inspection issued by the Belgian Colonial Service for lay meat inspectors in the Belgian Congo. It is agreed that the trained veterinarian is the best person to carry out meat inspection: practical difficulties, however, make it impossible to employ veterinary surgeons in all districts and Congo law therefore allows the use of lay inspectors for meat inspection. It is for these that the notes have been prepared.

The instructions comprise short anatomical notes, notes on methods of slaughter, discussion of methods of carcass examination and a list of ten principal conditions which may produce an abnormal carcass. Each condition named is described in some detail and the appropriate judgment is given for the information and guidance of the inspectors.

The specific and contagious diseases are perforce only scantily treated: it is to be noted that in the case of a carcass suspected of anthrax the g. pig inoculation test or, if putrefaction of the carcass has set in, the Ascoli test, is used, not microscopic examination of the blood after suitable staining.

Tables are appended giving the chief differences between certain organs of the horse and ox, pig and calf, and sheep and goat. The work is clearly printed and should prove suitable for such lay inspectors. Both the Belgian law for meat inspection and special Congo ordinances are quoted for guidance.—D. S. RABAGLIATI.

MARSHALL, F. H. A. [C.B.E., Sc.D., LL.D.,

F.R.S.], & HALNAN, E. T. [M.A.]. (1946.) **Physiology of farm animals.** pp. ix+339. 119 figs. Cambridge: University Press. 4th Edit. 8vo. 18s. 735

The first edition of "Physiology of farm animals" was published by Dr. MARSHALL in 1920. A second volume, dealing with nutrition and written by PROFESSOR WOOD, would have followed had Professor Wood not died in 1929. In 1932 the book appeared again under the authorship of MARSHALL & HALNAN as a single volume and a third edition appeared in 1945. The present work is little more than a reprint of the 1945 edition, illustrations, text and pagination being practically identical. The illustrations have remained almost the same since 1932 and many of them appeared in the first edition in 1920.

The main purpose of the book is to serve as a textbook for students of agriculture and this it does quite well. The authors also express a hope that it may prove useful for veterinarians, but it does not cover sufficient ground for the student and only some sections of it are likely to interest the qualified veterinarian. The text is uneven in quality. As is to be expected, the sections dealing with reproduction and nutrition are the best. Other subjects are sometimes barely considered: the red and white blood cells and the origin of the various constituents of milk are given almost no attention, whereas space is devoted to text and figures illustrating displacement of the os pedis, "chestnuts", spavins, splints and ringbones, subjects which could well be omitted from an elementary textbook of physiology.

In the opinion of the reviewer, many of the figures are unsuitable. A number of them are taken from old editions of human textbooks, whereas more useful illustrations of animal organs and tissues could be taken from appropriate publications. The kidney of man and of the rat, for example, could be replaced by illustrations from textbooks of veterinary anatomy. Many of the figures could with advantage be replaced by instructive ones. Figure 108, for instance, showing an 18-year-old ewe with lamb is a poor reproduction. At the end of the text is a list of books for further reference. Their dates of publication are not given.—E. G. WHITE.

PUFFER, R. R. [Dr. P.H., Tennessee Department of Public Health]. (1944.) **Familial susceptibility to tuberculosis. Its importance as a public health problem.** pp. x+106. 9 figs., 18 tables, 3 appendixes. Cambridge, Mass.: Harvard University Press. 8vo. 11s. 6d. 736

In reviewing the history of investigations into TB. in human beings, the author draws attention to the change in outlook which followed the dis-

covery of the tubercle bacillus by KOCH, *viz.*, the tendency to emphasize infection with the specific organism and to neglect the influence of other factors, in particular those of heredity and environment. The author feels that the reasons why certain individuals are susceptible to attack has not been adequately studied and she has collected new epidemiological and statistical data through a special research programme undertaken in Tennessee, in which case histories from carefully selected families were analysed with particular reference to the incidence of TB. in twins, siblings, parents, consorts, etc.

With regard to hereditary factors, it was demonstrated that the percentage of monozygotic twins who develop TB. is nearly three times that of dizygotic twins when one of the pair contracts the disease. This difference can scarcely be ascribed to the weight of infection to which the subjects have been exposed, but seems to be related to the terrain in which the organism is planted and points to a genetical factor which influences resistance. It was also found that siblings of persons known to have become infected in adult life and to have died from the disease develop TB. more frequently than do members of control groups.

An examination of family histories indicated that persons in families known to be susceptible to TB., *i.e.*, in which there was evidence of the disease in parents or siblings, ran a greater risk of developing the disease from tuberculous consorts than did consorts from less susceptible families. Thus two factors, namely, hereditary susceptibility and exposure to the organism, both appear to play a part in the incidence of the disease; moreover, the decline in the TB. rates may be partly attributable to the reduction in susceptible families in the population. The interesting work of LURIE [see *V. B.* 12. 199] on the establishment of races of rabbits with familial characteristics in their susceptibility and resistance to TB. is mentioned, since his findings appear to support the theory of an hereditary diathesis.

It should be recognized, however, that the interpretations which the author places on her figures are open to question. In the opinion of the reviewer it is conceivable that the differences in the infection rates can be ascribed solely to variations in the weight of infection to which the groups were exposed. It is difficult to assess the importance of familial susceptibility except under those conditions where the chances of exposure are constant in all the groups.

No reference is made in the book to the veterinary aspect of the problem but it is obvious that a detailed study of various types of herds by a statistician and epizootologist, along the lines

indicated in this book, might yield valuable information.—R. E. GLOVER.

BARNARD, W. G. [Professor of Pathology, University of London], & ROBB-SMITH, A. H. T. [Nuffield Reader in Pathology, University of Oxford; Director of Pathology, Radcliffe Infirmary]. (1945.) **Kettle's pathology of tumours.** pp. viii + 318. 191 figs. London: H. K. Lewis Co. Ltd. 3rd Edit. 8vo. 21s. 737

This book makes a welcome reappearance after a lapse of 20 years. In its original form it was designed especially for students and was personal in its approach and presentation. The authors of this edition are to be congratulated on so successfully maintaining this individuality. The general format has been retained with alterations necessitated by advances in knowledge of the histogenesis of certain tumours, *e.g.*, molluscum fibrosum was previously described under the heading "Fibroma" but has now been transferred to the section dealing with tumours of the peripheral nerves, and more correctly termed cutaneous neurofibromatosis. Similarly, hypernephroma, formerly dealt with in the section on teratomata is now included in the urinary system and the lympho-sarcomata are in the new edition classified under the reticulo-sarcomata. New illustrations are included in the latter section. These consist of compound photomicrographs comprising a low power view of the distribution of reticulum partly bordering a high power view of part of the same section, and make an effective and useful comparison of the various forms of reticulosarcoma immediately possible.

Other changes have been made in the sections dealing with the melanomata, kidney, lungs and bronchi, ovary, suprarenals and pituitary, in order to bring these up to date. The original excellent drawings by Kettle have been retained throughout the book.

The chapter on treatment has been eliminated from this edition.

The great advances in experimental cancer research made since the original edition are outlined in Part 1, dealing with the general biology of tumours; as a result this part has been largely rewritten. One would like to have seen more mention of transmissible tumours such as the transmissible lympho-sarcoma of dogs and papillomata in cattle and dogs. The transmissible tumours of chickens are mentioned, also the rabbit papilloma (Shope). When dealing with the hyperplasia of the bile ducts in the liver of rabbits due to coccidial infection, the old name "*Coccidium oviforme*" is applied to *Eimeria stiedae*.

See also absts. 726 (veterinary profession and its laws).

Finally, one notes the almost complete omission of any reference to the leucaemias, although these are now generally recognized to be neoplastic in nature. They may not be "tumours" in the strict pathological sense, but surely it would have been as well to modify the title of the book so that they could logically have been included.

The general appearance and quality of the book is excellent, despite the present restrictions.

—JOHN G. CAMPBELL.

HERMS, W. B. [Sc.D.], & GRAY, H. F. [Gr.P.H.]. (1944.) **Mosquito control. Practical methods for abatement of disease vectors and pests.** pp. xiv + 419. 86 figs., 11 plates. New York: The Commonwealth Fund. 2nd Edit. revised. 8vo. 20s. 738

While it is true that the advent of synthetic insecticides has laid a new and greater emphasis on the chemical control of mosquitoes, this has been less in the nature of a revolution than of a great advance in scope of already well established methods. Greater efficiency from smaller amounts of poisons with greater selectivity is the keynote of modern chemical control of insects.

This edition was published before the full use of D.D.T. and benzene hexachloride was known; larvicides and poisons for adult mosquitoes are thus allocated a minor role. Hygiene and drainage engineering are given first importance and are still the basis of sound control even with the introduction of these dramatically effective new substances. Control in swamps, salt marshes, and pools by larvivorous fish, by oiling, by larvicides and by interference with rate of flow of water and with sheltering vegetation is described in suitable fashion.

The economics of control, the improvement in human health on the extermination of vectors of malaria and other diseases, the improvement of amenities on the reduction of noxious though non-disease-bearing species are dealt with in a convincing manner and the importance of propaganda in eliciting public interest and co-operation is discussed. The example of one Californian district where mosquito control has been enthusiastically and successfully supported is reported in detail.

Keys for the identification of vector species and tables of their distribution are provided for the non-specialist. The identification of the noxious species, tracing them to their breeding haunts, study of their distribution and choice of control measures in relation to the biology of the species are shown as the most important preliminaries.—T. SPENCE.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications indexed for this purpose was included in *Index Veterinarius*, Vol. 6. No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

About 10,000 references are indexed each year, each reference being suitably cross-indexed alphabetically under subjects and under names of authors.

As each half-yearly issue consists of a single complete alphabetical index of subjects and authors' names, a search through it involves a minimum of trouble, and all information required is readily found.

Each number contains the indexing done by the Bureau during the previous half-year, *i.e.*, No. 1, issued in December, covers the indexing done during the previous January to June.

The dates of issue of the two numbers of each volume are as follows :—

- | | |
|-------------------------|---|
| No. 1.—Issued December. | Indexing period previous January—June. |
| No. 2.—Issued June. | Indexing period previous July—December. |

Vols. 1 to 3 (1933, 1934 and 1935) of the Index were produced on a duplicator ; from Vol. 4 onwards it has been printed.

Vols. 1 to 5 were issued in quarterly parts ; the regular issue is now half-yearly, but owing to post-war conditions it has been found necessary to combine into one issue parts 1 and 2 of volume 13, and also of volume 14.

Annual Subscription, £5.

A limited number of copies printed on one side only are available for those who wish to mount references on cards.

Orders may be sent to :—

CENTRAL SALES BRANCH,
(IMPERIAL AGRICULTURAL BUREAUX),
PENGLAIS,
ABERYSTWYTH,
WALES.

IMPERIAL AGRICULTURAL BUREAUX

JOURNALS PUBLISHED BY BUREAUX ON RELATED SUBJECTS

Published by the:—

DAIRY SCIENCE ABSTRACTS	IMPERIAL BUREAU OF DAIRY SCIENCE, SHINFIELD.
ANIMAL BREEDING ABSTRACTS	IMPERIAL BUREAU OF ANIMAL BREEDING AND GENETICS, EDINBURGH.
HERBAGE ABSTRACTS	IMPERIAL BUREAU OF PASTURES AND FORAGE CROPS, ABERYSTWYTH.
NUTRITION ABSTRACTS AND REVIEWS	IMPERIAL BUREAU OF ANIMAL NUTRITION, ABERDEEN.

Annual subscription to the first three is 25s. (with a special reduction of 20 per cent. for orders received direct from subscribers in Great Britain, the Dominions and Colonies); the annual subscription to Nutrition Abstracts and Reviews is 42s.

RECENT OCCASIONAL PUBLICATIONS ON AGRICULTURE AND FORESTRY BUREAUX JOINT PUBLICATIONS

No.		Price
6.	Alternate Husbandry. Imperial Bureaux of Pastures and Forage Crops, Soil Science, Animal Breeding and Genetics, and Animal Health, May, 1944	5s. od.
9.	The use of aerial survey in forestry and agriculture. Imperial Bureaux of Forestry and Pastures and Forage Crops, 1946 ...	4s. od.
10.	The use and misuse of shrubs and trees as fodder. Bureaux of Pastures and Forage Crops, Forestry, and Animal Nutrition, 1946	6s. od.
11.	Some British books on agriculture, forestry and related sciences, 1939-45. July, 1946	3s. od.

TECHNICAL COMMUNICATIONS, ETC

Imperial Bureau of Animal Health, Weybridge.

Review Series No. 2. Modes of spread of *Streptococcus agalactiae* infection in dairy herds. A report on co-ordinated observations by the Agricultural Research Council of the United Kingdom. May, 1944 3s. od.

Imperial Bureau of Animal Nutrition, Aberdeen.

15. Minerals in pasture. Deficiencies and excesses in relation to animal health. By F. C. Russell. May, 1944 5s. od.

16. Diet in relation to reproduction and the viability of the young. Part I. Rats and other laboratory animals. August, 1946 3s. od.

Imperial Bureau of Animal Breeding and Genetics, Edinburgh.

The semen of animals and its use for artificial insemination. By James Anderson. Spring, 1945 7s. 6d.

Imperial Bureau of Pastures and Forage Crops, Aberystwyth.

36. The grasslands of Latin America. By Miss G. M. Roseveare. Late 1946 ... 7s. 6d.

38. Advances in grassland husbandry and fodder production. Second symposium. Late 1946 4s. od.

Imperial Bureau of Plant Breeding and Genetics, Cambridge.

The new genetics in the Soviet Union. By P. S. Hudson and R. H. Richens. May, 1946 6s. od.

Imperial Bureau of Soil Science, Harpenden.

43. Land classification for land-use planning. June, 1946 4s. od.

Imperial Mycological Institute, Kew.

An annotated bibliography of medical mycology, 1945. 1946 5s. od.

SUBSCRIPTIONS

All correspondence regarding subscriptions to journals and sales of occasional publications should be addressed to, and cheques made payable to:—Central Sales Branch (Imperial Agricultural Bureaux), Penglais, Aberystwyth, Wales.